Telephony.

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TELEPHONE REGULATION FROM THE COMMISSION'S VIEWPOINT

No matter how much we improve, the time will probably never come when there will be no more controversies between the service companies and their patrons, with the state commission acting as umpire. The coming years may bring different regulation methods—and possibly worse ones than the present—for the theory of state regulation has worked pretty well, when given a fair chance and politics is kept on the sidelines.

The present system would work better if there were more cooperation between the commissions and the companies along the lines that after all they both have a common cause in giving the public satisfactory service. Furthermore, that harmony can be cultivated between regulators and regulated with good results for the rate-payers.

The quarreling with the Michigan commission over the question of the Bell salary list is not an edifying spectacle, even though it may satisfy curiosity as to the compensation of A. T. & T. officials. In Indiana a telephone holding company has found it more profitable to cooperate with the state commission by agreeing to certain stipulations, inasmuch as the commission thereupon ended the proceedings.

* * * *

If the theory of state regulation of public utilities is to survive there must be more cooperative action between the company and the commission. Otherwise, the public may well favor abolishing the commission and let the rate cases go at once to the courts.

The anti-utility politicians at Washington who want federal regulation are rejoicing at every dispute between the state and a service company. All these wrangles strengthen their contention that state regulation has failed. Yet there is plenty of evidence on the other side of the case.

* * * *

L. O. Whitsell, a member of the California Railroad Commission, says that the advantages of friendly cooperation have been fully demonstrated by the companies and the regulatory authorities of that state. By conferences and negotiations, instead of controversial rate litigation, the people of California have saved three million dollars in the last three years—that being the estimated expense saved by agreement. Otherwise, the rate-payers would have had the cost of the fight included in their service bills.

"In my judgment," says Commissioner Whitsell, "the remedy to be applied does not lie in the realm of the law, but in that of human relations and economics. The companies can improve conditions by voluntary action, and thus, in a measure, at least, become largely self-regulating insofar as the adjustment of rates is concerned. I refer to what I choose to call 'regulation by conference' as against formal proceedings. Much good has been accomplished in the past through amicable adjustments effected around the conference table, and I believe that much more is to be accomplished in the future."

As to the best method to be followed by the company, Commissioner Whitsell advised: "When the utility sees that its rate of return is exceeding the rate allowed by the commission, that it voluntarily work out a reduction and obviate the necessity of action by the commission or the consumers. Also, in case an increase is imperative, the same method can apply."

Telephone Regulation.

Similar advice comes from a state on the other coast—Massachusetts—where, by the way, telephone regulation has been given special attention. The telephone has been the hobby of William H. O'Brien, of the Massachusetts Department of Public Utilities, for 20 years, and as director of the telephone and telegraph division he has acquired a wide experience in all the angles of service. He is a strong believer in the theory that both company and public get the best results from friendly conferences, rather than resorting to hostile sparring before a commission or in court.

* * * *

Mr. O'Brien had an article in the United States Daily recently discussing telephone regulation which contained advice valuable to all telephone companies. The Massachusetts department has carried on its work of telephone supervision with a staff which specialized on service problems rather than on an engineering basis which other states followed. The keynote of Mr. O'Brien's administration is that "every time it helped the telephone company to do a better job it was helping the business subscriber in

a bread-and-butter way, with a corresponding benefit to the residence subscriber."

The vital importance of telephone service in American life is recognized by Director O'Brien when he says:

"It will be readily agreed that as important as is transportation, gas, electric light, etc., the most vital artery of our whole industrial structure, to say nothing of our social activities, is telephone service.

While the average person, outside of the commuter, uses transportation facilities infrequently, the business world is bound up every minute day and night in telephone service which, proportionately, is just as valuable to the little fellow on the side street with no one to help him in his business as it is to the great banking or business institution. Those doing the work for the Massachusetts commission have always tried to keep that idea in mind."

* * * *

During the last 20 years the Massachusetts telephone division has proposed rules, regulations and practices designed to improve the service, and encouraged the companies to meet and confer so that matters can be settled amicably rather than by official mandate. Thousands of cases have been handled without the necessity of formal hearings which too often lead to ill feeling. This, of course, shows the value of cooperation.

To quote Director O'Brien again:

"In nearly 20 years, the division has successfully handled about 30,000 specific cases involving every ramification of telephone service, accounting, collection practices, shortage of facilities, special construction charges, etc.

At first it was hard for telephone officials to see anything but the company's side of the various cases that came up, but gradually they came to understand that the more they were ready to meet the representatives of the state half way, the better their public relations, with better results to the company and stockholders.

It is quite true that the telephone company, despite all its publicity (which was perfectly proper and good business) has made little progress in its all-around relations with the public. That has not been because the officials of the company were not eager to secure the good will of subscribers and have them understand that if they were not being treated right, they could call upon the Department of Public Utilities to adjust their troubles, but because of the general feeling against all utility companies during the last few years.

It was a difficult job for the forces of the department handling the telephone problem, to wean the telephone officials, with whom they did business, from the idea that the 'king can do no wrong' and start off with the idea that the complainant against telephone service or the actions of telephone officials was an enemy.

If public utility people could only get it into their minds that the one who complained to them of the service, giving them a chance to correct the trouble, is a friend, it would be the greatest step of progress in the development of a better understanding with the rank and file of the public that they have ever taken."

* * * *

In conclusion Director O'Brien expresses regret that citizens do not more often understand that they can submit their telephone problems to the commission and get relief, instead of injuring the company by making complaints at the corner grocery. Usually a conference with the company and the commission is sufficient to adjust the trouble.

He also affirms that relations between telephone officials and the commission are of the best, and "while some of the sessions concerning telephone matters are quite strenuous it is always with the feeling on both sides that every adjustment that can be made is for the benefit of both telephone company and the public."

A more general cultivation of this spirit would lessen the friction between companies and regulatory commissions and remove much of the criticism now existing against state regulation of public utilities.

Service Surveys to Foster Growth

United Telephone Co., Abilene, Kans., Tops Previous Record in Annual Spring Sales Campaign—Gain During Survey Should Not Affect Normal Development—Details of Kansas Sales Campaigns—Unique Plans Used

By Dan Hughes,

Assistant Advertising Manager, United Telephone Co., Abilene, Kans.

The United Telephone Co., which operates 58 telephone exchanges serving over 50,000 patrons in northwestern Kansas, has been very thorough in conducting annual employe sales contests and station development campaigns. Every group of telephone exchanges has turned to such campaigns for consistent gains in stations. Each has its own particular plan for conducting the sales work but an interchange of methods is always possible. The basic plan used by the United is the same as for all the others, but the details are quite unique.

The United Telephone Co. is not a recently organized utility. In fact, it has been serving northwestern Kansas for almost 30 years. The station saturation of the United is 30.93 telephones per 100 of population in the territory served. This is one of the highest ratios in the United States for a diversified territory. With these facts in mind, it is readily observed that the development campaign of this company must be carefully planned and executed in order to show any appreciable station gain.

Plans for the annual United service survey begin to form just as soon as the campaign is completed in the previous year. Results are tabulated and studied to get the trend of telephone demand. The reports of personal interviews made by employes—40,000 of them—are all read and sorted. These interviews are a cross-section of public opinion and their bearing on the campaign is invaluable.

After these post-campaign computations are made, the preparation for the following year remains somewhat inactive for several months. Instrument reports are carefully watched, however, to see how much of the gained business is lost in a few months. In United experience this loss has been small, but, if there should be a general gained station decrease, the commercial representatives would be right out there checking up the reason for it.

United employes sell service. The slogan of the commercial department is "Every employe a salesman." This did not "just happen," but is the result of continuous education and training. The success of each annual service survey is assured by the special educational work done in the three months before the campaign is held.

New Features Used Each Year.

In January the district managers are called in to the Abilene general office for a two-day conference. The campaign is the main topic at that time and all suggested plans and new ideas are discussed. The feature to be emphasized in the sur-

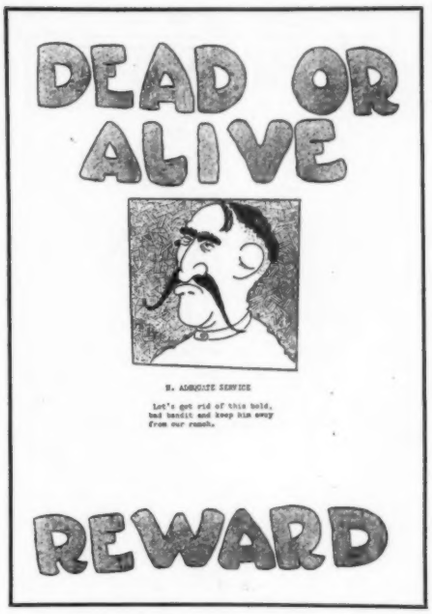
vey is decided at this meeting. Each year new selling ideas are used to lend variety to the work.

After the district managers' meeting, the detailed plan for the actual two weeks of selling is worked out by commercial employes, using their suggestions as a foundation. In the 1931 survey, the sale of handsets was a feature of the plan. This brought out the topic of modernizing the whole subscriber installation and naturally led to the sale of extensions, wiring plans and extensive grading up of service.

In order that bulletins and other information from the general office could have a connecting theme, the contest was turned into a "rodeo." Employes became cowgirls and broncho busters for the duration of the campaign. The annual survey newspaper, mimeographed, appeared in wild western dress.

Campaign advertising and literature for distribution to the prospect were prepared. The main booklet this year included sales arguments for new subscribers, convenient telephone equipment, and long distance. The various classes of rates were explained and the last pages were devoted to a personal out-of-town directory. The booklet carried illustrations that were in keeping with its sales points.

During the two weeks of the campaign over 40,000 of these booklets were personally placed in the hands of subscribers and prospective patrons by employes.



One of the Bulletins Issued During the Campaign, Which Is Typical of Others. They Were All Based on the Rodeo or Wild West Theme.

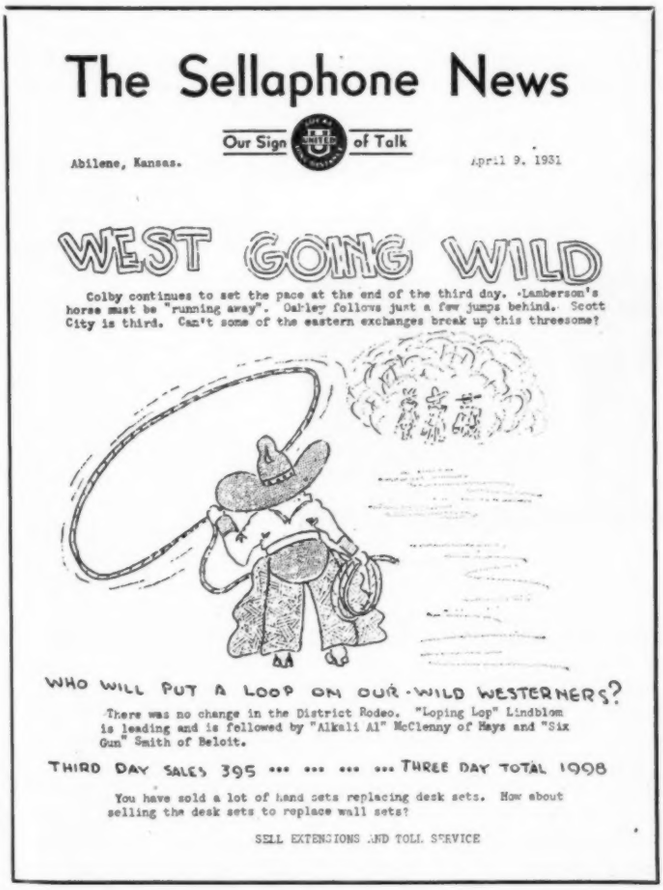
The mechanics of quota assignment were similar to those encountered everywhere. The only point the United stresses in this is that quotas must be fair to all and of such amount that they can be reached by every exchange through average campaign effort.

Rewards for employe sales ability were in the form of merchandise prizes. This is the one feature of campaign plan that differs most widely between companies. Some reward winners with a party, some with cash awards per sale. There is no limit to the variety of rewarding plans.

The United uses merchandise prizes, because it believes that such an award is highly appreciated by the employe. One award this year was a complete set of matched, steel-shafted golf clubs in a grained pigskin bag. Articles of merchandise are grouped according to value, and employes win according to the number of sales and interviews made.

Without question, the most important activity in preparing a United campaign is the final field trip just before the two weeks of actual selling. Representatives from the general office hold group meetings with employes at all exchanges. These representatives are selected for their enthusiasm and ability to arouse interest in the field. Their meetings constitute a pep rally and sales school that puts everyone on edge to begin selling.

The interview is just as carefully rehearsed as if each telephone sale were to be a million-dollar deal. Employes play



The Sellaphone News

Our Sign of Talk

Abilene, Kansas. April 9, 1931

WEST GOING WILD

Colby continues to set the pace at the end of the third day. Lamberson's horse must be "running away". Oakley follows just a few jumps behind. Scott City is third. Can't some of the eastern exchanges break up this threesome?

WHO WILL PUT A LOOP ON OUR WILD WESTERNERS?

There was no change in the District Rodeo. "Loping Lop" Lindblom is leading and is followed by "Alkali Al" McClenny of Hays and "Six Gun" Smith of Beloit.

THIRD DAY SALES 395 ... ... THREE DAY TOTAL 1098

You have sold a lot of hand sets replacing desk sets. How about selling the desk sets to replace wall sets?

SELL EXTENSIONS AND TOLL SERVICE

Information Bulletins in the April Campaign of the United Telephone Co., Abilene, Kans., Were Based on a "Rodeo" as This Year's Contest Was Very Cleverly Designated.

Cover Illustration of Attractive 16-Page Booklet Which Was Printed in Blue and Black. It Was Distributed to More Than 40,000 Patrons During the United Campaign.

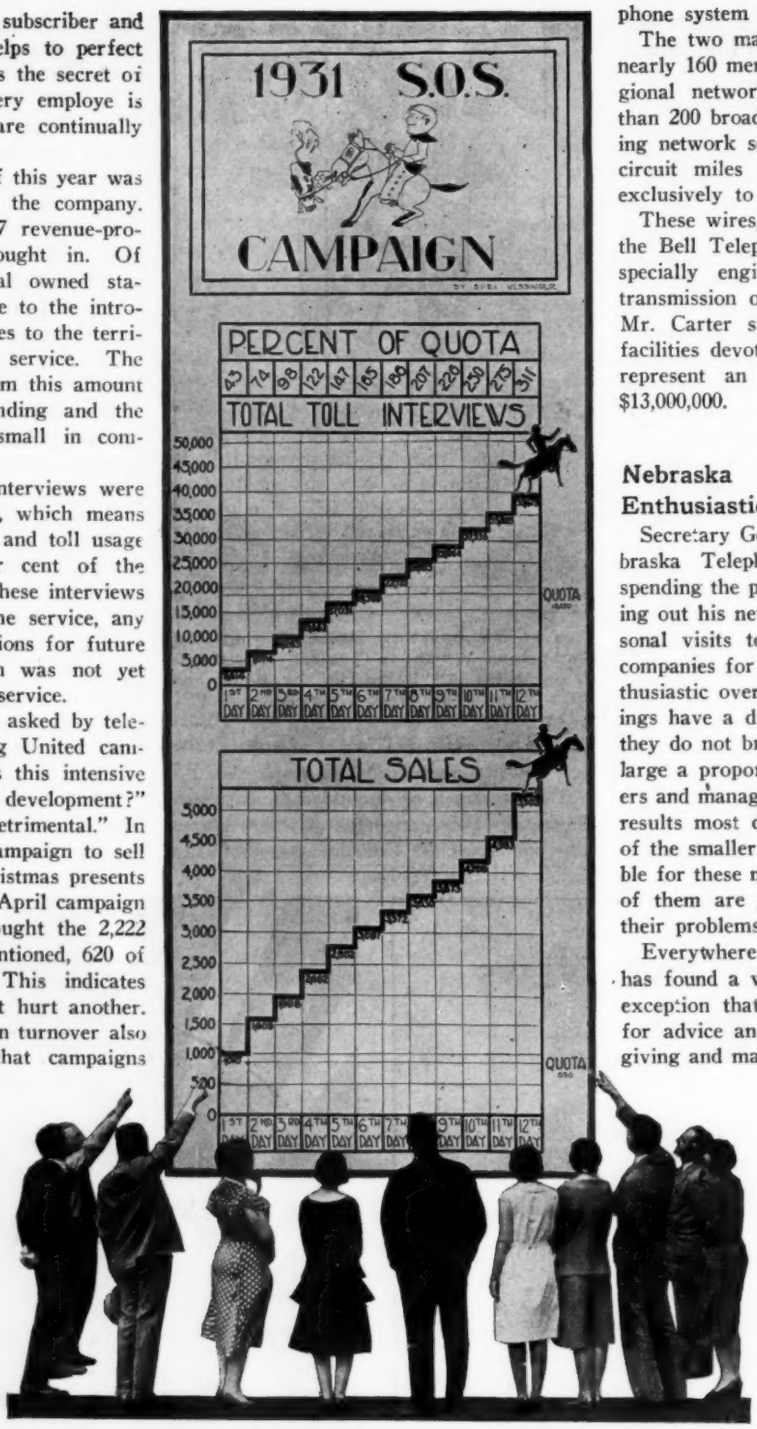
the parts of salesman and subscriber and everyone at the meeting helps to perfect the sales approach. This is the secret of United sales success. "Every employe is a salesman" because they are continually taught to sell.

The campaign in April of this year was another record-breaker for the company. In 12 days of selling, 5,307 revenue-producing contracts were brought in. Of these, 2,222 were additional owned stations. The other 3,000, due to the introduction of handset telephones to the territory, were grading up of service. The annual revenue increase from this amount of new business is astounding and the cost of securing it was small in comparison.

More than 40,000 sales interviews were made during the campaign, which means that toll service, toll rates, and toll usage were explained to 80 per cent of the patrons of the company. These interviews brought out opinions of the service, any equipment faults, and notations for future sales contact if the patron was not yet ready to accept improved service.

The first question always asked by telephone men when discussing United campaigns is "What effect has this intensive sales effort on your regular development?" The answer is, "Nothing detrimental." In December, 1930, a quick campaign to sell extension telephones as Christmas presents resulted in 378 sales. The April campaign in the same exchanges brought the 2,222 new stations previously mentioned, 620 of which were extensions. This indicates that one campaign does not hurt another.

Examination of the station turnover also bears out the statement that campaigns should not affect the normal station development. During 1929 and 1930, the last two previous years during which campaigns similar to this one were held, the survey sales appeared on the instrument reports in the months of April and May. The 20 months not showing campaign installations had an average monthly net gain of 94 stations. This proves the point that campaigns do not slow up normal monthly development.



Every United Employe Was Interested in the Progress of the Survey. Daily Posting of the Results Was the Signal for All to Gather About the Scoreboard.

United campaigns are unique in the emphasis that is placed on preparation, in the thoroughness of the sales education, in the method of awarding prizes, and in the fact that, in spite of abnormally high development, every campaign has bettered the previous year's sales record. Any telephone man wishing to compare notes and ideas on such service surveys will find the United Telephone Co., with headquarters at Abilene, Kans., more than willing to supply information, data or samples of advertising and bulletins used.

Two Radio Networks Are Largest Telephone Users.

By far the largest single class of users of the telephone system of the United States are the two major radio networks, the National Broadcasting Co. and the Columbia Broadcasting System, and the various regional network services which link stations together by telephone lines for national and regional programs.

These services and the various remote control pickups employed by individual stations represent a revenue to the telephone system of over $5,000,000 annually.

The two major networks together have nearly 160 member stations. With the regional networks added, there are more than 200 broadcasting stations now receiving network service regularly over 40,000 circuit miles of telephone wire devoted exclusively to program transmission.

These wires, H. H. Carter points out in the Bell Telephone Quarterly, have to be specially engineered for the successful transmission of music as well as speech. Mr. Carter states that the Bell System facilities devoted to broadcasting purposes represent an investment of more than $13,000,000.

Nebraska Association Secretary Enthusiastic Over Personal Visits.

Secretary George M. Kloidy of the Nebraska Telephone Association has been spending the past month in the field, carrying out his new policy of substituting personal visits to managers and owners of companies for district meetings. He is enthusiastic over the results. District meetings have a distinctive value, he says, but they do not bring within their influence as large a proportion of the telephone workers and managers as is necessary to get the results most desired. Time out for some of the smaller company staffs is not possible for these meetings, but he finds that all of them are just as vitally interested in their problems as those who do attend.

Everywhere he has gone Mr. Kloidy has found a warm welcome, and it is the exception that he has not been called on for advice and aid in matters of service-giving and management. His visits during the month were well-timed in many instances.

A number of managers had not garnered the information that Secretary Kloidy had secured a ruling from the state tax commissioner that eliminated the taxation of franchises through permissible deductions, and local taxing authorities were hazy about what they were to do. Some had received the notice from Mr. Kloidy and had forgotten all about it. In the end he was able to secure proper assessments for the companies.

The taxing authorities are not overlooking any source of revenues. Officials of the Lincoln Telephone & Telegraph Co. had to journey all the way to Hastings to argue with a board that had its back all bowed to assess the company on its book cost value, supposing that it earned rates on this basis, and was astonished to know that depreciated or present value is the basis of rate-making as well as of tax returns of a telephone company.

The Telephone as Advertising Medium

Solicitation of Business Over Telephone with Particular Reference to Use by Telephone Companies in Developing Toll Business—Some Suggestions to Companies for Determining Effect of Calls Which Detract from Value of Service

By L. D. Jennings,

Assistant Professor, Finance and Public Utilities School of Business, University of Kansas, Lawrence, Kans.

Certain businesses have adopted the advertising telephone call as a means of securing additional patronage. It has, also, been suggested that the telephone companies themselves adopt this method of soliciting as a means of stimulating toll business. Before going forward with this development, however, a careful inquiry into the reactions of subscribers generally to this form of advertising should be made to determine not only the probable results to the advertiser, but its probable effects on the telephone business.

If the consumer reacts unfavorably to the call, the advertiser secures no return and the telephone company loses service values for aiding and abetting a nuisance. If the consumer reacts favorably, the advertiser secures a sale, but the telephone company receives little special credit for its part in the transaction. The telephone company, therefore, must be alert to protect its subscribers from annoyance if its product is to retain its value and the business prosper.

In some localities motion picture houses and others use the telephone regularly to inform the public regarding current attractions. Other enterprises use the service periodically for this purpose. Many of these advertisers find this method highly profitable from their point of view. If one call in five, one call in ten, or one call in 25 or more produces results, the advertising company may, depending on the "profit" on the sale related to the "cost" of telephoning, produce results which are very gratifying.

These calls, however, may seriously encroach upon the time of certain groups of subscribers and may materially lower the value of the telephone service to them. This loss in value should be charged to the concerns responsible, making possible a corresponding reduction in the rates charged the aggrieved subscribers.

Business rates, however, have not been made on the assumption that the telephone would be used for advertising purposes. Consequently the advertisers are not, generally, paying their fair proportion of the cost of the service. This is particularly true when a flat monthly rate is charged, and only partially disappears when the calls are metered.

A business or commercial subscriber who calls, four, nine, or 24 or more subscribers from work or play to listen to an advertising talk, however short, for every *one* subscriber interested in the call should pay more per call than is charged for calls in which both subscribers are reasonably interested.

Just how much more per month or per call the telephone company should receive from the advertising caller is impossible to determine except within very broad limits. The problem is essentially one of estimating what it would be worth to the average subscriber not to be called away from his activities, minus the clearly recognized gains which he secures from advertising calls.

In any case, the telephone company should secure greater revenues from those who use the telephone for advertising purposes. The exact amount, however, must be worked out in accordance with local conditions prevailing in the industry. Since it is particularly difficult to increase the number of classes of telephone service based on the type of call involved, the application of a special rate to telephone advertisers constitutes a complicated problem.

Metered service to customers inclined by the nature of their business to use the telephone for advertising purposes would be a partial solution. This would doubtless stop the greatest pests and leave the service open to others. A motion picture house, for instance, with an admission charge of from 35 to 50 cents could not afford to pay from three to five cents per call for advertising purposes, since the added patronage would not cover the advertising expenditure.

If metered service is impracticable, or if advertising by telephone still remains a problem, the telephone company should provide a special rate for such users and have their subscribers classify the advertising companies for them. When sending out the monthly bill a flier could be attached, reading somewhat as follows:

To Our Patrons:

Your telephone company earnestly desires to furnish you the best possible service, free from trouble and annoyance. In order to do this, it is necessary for us to have your cooperation and suggestions. We are, therefore, providing the following blank for your convenience in reporting to us regarding the service which we render.

Sincerely,

SERVICE TELEPHONE COMPANY.

SUBSCRIBER'S REPORT
Telephone Service

1. Reception: Good Average Poor (Check word applicable.)
2. Disturbing Calls (give name of responsible party, if known, and approximate number of calls).....
   .....
   .....
   A. Wrong Numbers.....
   .....
   *B. Advertising Calls.....
   .....
   C. Others .....
   .....
3. Miscellaneous Remarks.....
   .....

*Note: The company has established the policy of charging companies using the telephone for advertising purposes a higher rate. We are informed that these calls are disturbing to a large number of subscribers. In order that these companies may be properly classified, we are asking you to supply us with the names of the companies which have disturbed you. This special rate should operate to reduce the number of unwarranted disturbances as well as provide additional revenue for improving the service.

Such a flier sent out monthly, or even quarterly, would keep the telephone company in friendly touch with its subscribers and provide a method of checking up on calls which detract from the value of the telephone service. It may be that these interruptions are insignificant and on the whole can be ignored.

If, however, the company finds over 10

TRUE FRIENDLINESS

Sincerity is the very foundation stone of true friendliness. It is also a human trait that is hard to counterfeit, as the sincere friendly impulse comes from the soul of a man and not from the calculating mind.

Think kindly and friendly thoughts. If you have a heart and a soul, why be ashamed of them? Bring them into the shop, the office and your daily life. The hand may be cunning, and the head may contain the brain that can conceive the most brilliant thought, but every good and worthy impulse comes from the heart.

Strengthen your faith in men, think kindly of them, believe that they are your friends, and in the long run they will be.—Raymond Congreve.

per cent of its subscribers complaining about a particular company, it is reasonable to assume that such advertising is at least unprofitable to the telephone company. An increasing number of subscribers are looking to the telephone companies for protection from needless interruptions, and the foundation for this protection is best laid when advertising by telephone is in its infancy.

Turning now to the question of the use of the telephone call for telephone advertising, the dangers involved should be obvious. In these instances the telephone company has absolutely no excuse for calling a disinterested subscriber away from his daily activities to tell him about the glories of a toll call made on, say, Mother's Day.

In certain rural communities where people enjoy telephone calls, it may be all right, but an average subscriber resents rushing to the telephone in response to the slogan, "Answer Promptly," to find that it is only someone trying to sell him something.

The mere fact that toll business this year on a particular day was 20 per cent over the same day last year as a result of calling the subscribers does not in itself indicate that the plan was profitable. Much of this added business could doubtless have been secured by an advertising folder enclosed with the telephone bill. The additional business probably represented a loss when the added expense of calling and the subscribers' ill-will are considered.

The reactions of subscribers to the use of the telephone as an advertising medium will differ with localities, but before going forward with its development the telephone companies should carefully consider the long-time effect on their industry.

Pacific Northwest Company Adds 540 Stations in Sales Campaign.

The Oregon-Washington Telephone Co., of Hood River, Ore., recently completed a two-weeks' campaign for new subscribers which resulted in a net increase of 540 stations. This represented an 8.5 per cent increase in subscribers, and was 276 per cent of the quota set. It is a record of which each of the company's 100 employes is justly proud.

The campaign was conceived by Minor Corman, president of the company. It was carried out by Merle A. Miller, sales manager, with the aid of five divisional managers, who served as captains of competitive teams, and the entire personnel of the company. The quota assigned was 200 stations, or two new stations or the equivalent in revenue, for each employe. In the campaign ordinary sales methods were applied to the selling of the commodity manufactured—telephone service.

Prior to opening the campaign, on May 1, sales rallies were held at the headquarters of each division. Brief but enthusiastic talks were made on the subjects, "Who to Sell," "What to Sell" and "How to Sell." A list of non-subscribers, previously compiled from various sources, was placed in the hands of the sales force.

Prior to launching upon the campaign, government-stamped postcards had been sent out to non-subscribers, emphasizing the necessity and usefulness of telephone service and stressing the low cost of the service. Stuffers were also included in the monthly bills of subscribers, depicting newer types of instruments and describing the advantages of extension service particularly in the home.

Merle A. Miller, Sales Manager of the Oregon-Washington and Central Oregon Telephone Companies, Hood River, Ore., Was the Motivating Spirit of the Oregon-Washington Telephone Co.'s Recent New Business Campaign.

Personal solicitations were made of subscribers and non-subscribers alike. The company's staff was daily informed as to the progress being made by means of a daily mimeograph bulletin, known as The Campaigner.

The result of the campaign, as previously stated, was the addition of 540 subscriber stations. A sizeable amount of miscellaneous service was also sold. This additional business more completely saturated the plant with little or no increase in traffic expenditure. A prize was awarded the individual attaining the highest sales of all divisions and to the highest sales individual of each of the 18 participating exchanges. A small commission was also awarded for each station sold.

The company reports that the keynote of the success of the campaign was in having all of the details of the campaign worked out in advance so that everything progressed with clock-like precision from the day the campaign opened to the day it closed, when the results were assembled and honors awarded for good work.

What Operators Want to Know

Worthwhile Suggestions to Managers; Pass Valuable Information on to Employes—Questions and Answers Represent Timely Traffic Problems—Source of Novel Feature—Fourth Installment

Mr. Manager! Are you giving your chief operator and your operators an opportunity to join us in the search for knowledge which is being made under this heading each week? Or do you read and enjoy TELEPHONY yourself and then stick it into a drawer in your desk and forget that its contents *are* of interest to your traffic employes?

All of the questions published in this section of TELEPHONY are questions that have been submitted by telephone operators in Illinois at the traffic schools conducted in the district meetings held by the Illinois Telephone Association. They represent what your operators and your neighbors' operators wish to know.

The value of the information contained in this column can not be measured in dollars and cents. The operators who submitted these questions drove many miles to attend the district meetings to have these questions answered. Their interest in attending these meetings and submitting these questions has made this column possible.

Give your operators an opportunity to share in these benefits by supplying them with a copy of TELEPHONY each week. The benefits they will derive from this column will be worth more than the price of many years' subscription for TELEPHONY.

Read the questions yourself and see how many of them you can answer. They will help you to know more about the work that is being done in one of the most important departments of your organization—the traffic department.

Questions Asked by Illinois Operators.

1. If a tributary operator passes a call to her toll center, adding the word "holding," and the toll center operator has not completed the call within three minutes and has not released our subscriber, should we release him?
2. How often are district meetings held?
3. Is it necessary to call a subscriber on a collect call and tell him the charge is OK after conversation?
4. If we pass an Independent or Bell call and the called party is out and we leave word for him to call and the terminating toll center operator comes back with the same call and we tell her that is our call, what should either operator do?
5. How can we improve CLR service at tributary offices?

For answers to these questoins from the Illinois operators, turn to page 29.

Here and There in Telephone Work

P. B. X. Current Supply; Other Battery Charging Rectifiers.

By JOHN A. BRACKEN

P. B. X. storage battery chargers operating from a source of alternating current are now available which operate on the metallic principle. One commercial form of this type of battery charger consists of a number of copper disks. These are covered on both sides with a coating of copper oxide, which in turn is covered with a film of pure copper, Fig. 1.

When the center and outside of such a disk are connected to an alternating current power circuit, the current will pass through the oxide in one direction only, which makes it a rectifier. Such a rectifier is known under the trade name of "Rectox."

The current output from this type of rectifier is undirectional and uneven. Therefore it is first allowed to flow through a choke coil, which functions to smooth out the rectified current before it passes into the storage battery and thus avoids the possibility of excessive noises in the P. B. X. switchboard telephone circuits.

The Rectox rectifier is manufactured in various capacities, the amount of direct current passed being determined by the number of disks that the rectifier contains.

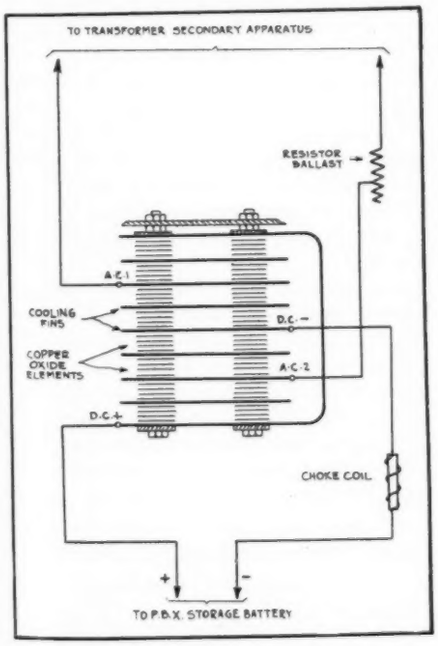


Fig. 1. The Rectox Rectifier.

Those types for use in telephone practices are designed to deliver a charging current of not more than 0.5 ampere at a direct current E. M. F. ranging from about 17 to 20 volts.

This low charging rate rectifier is of the "trickle" type and is connected to a step-down transformer to an E. M. F. necessary for trickle charging purposes. By trickle charge is meant the charging of a storage battery at a very low rate over a long period of time.

During a large part of the time the storage batteries located at some P. B. X. switchboards are practically idle, but they are required from time to time to supply operating current of 0.2 ampere or more.

In order to maintain the storage batteries in good condition, they may be kept on continual charge at a "trickle" rate. This method of charging is particularly satisfactory provided the total amount of charge received by the battery is sufficient to cover the discharge that occurs during the regular operation of the P. B. X. switchboard and also local action—that is, chemical action—within the storage cells tending to discharge them.

The amount of electric current required of the trickle charger is usually just enough to offset all this; or, if the battery is not in use, the trickle charge may be adjusted to counteract the local action and to keep the specific gravity within the storage cells constant.

The actual value of the trickle current will depend upon the concentration of the electrolyte in the cells and the temperature, as these factors affect the rate of local action; but this value is approximately equal to 0.5 per cent to 2 per cent of the regular eight-hour discharge rate of the particular group of P. B. X. storage cells involved.

This has an insurance feature, as well as the regular work of the battery, for it is charged at a certain per cent of discharge rather than when empty. In other words, a certain fixed percentage of the capacity is always held in reserve for emergencies.

Other forms of rectifiers suitable for the purpose of trickle charging storage batteries are of the mechanical and cartridge types. The mechanical type is simply an automatic switching device which reverses the direction of the electric current in synchronism with the alternating current power supply E. M. F. By synchronism is meant the unison of frequencies in alternating current apparatus; generally, the co-periodicity and co-phase of two periodically recurring events—that is, the coincidence in cyclic recurrence of two or more periodic variables, without regard to amplitude.

Mechanical rectifiers generally are of the vibrating types and of limited capacity of about 3 to 15 amperes. The moving part is a polarized armature so adjusted that it vibrates back and forth when the adjacent alternating current magnet is energized. This action closes the circuit through one pair of contacts with the current positive and through another pair with connections reversed when the current is negative. Except for the reverse connections, the two sets of contacts are in parallel with each other and in series with the battery.

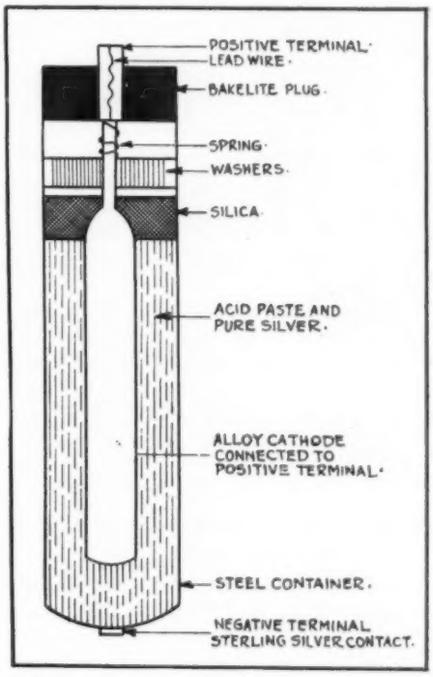


Fig. 2. Sectional View of the Metallic Cartride Type Rectifier.

In the metallic cartridge type of charger Fig. 2, the alternating current rectifier element consists of a small copper-coated steel cartridge similar to the enclosed type cartridge fuse, and capable of passing 2.5 amperes of charging current.

Current will flow in one direction only, from the positive alloy cathode to the steel shell, which is negative and makes connections with an external clip through the sterling silver contact at the end.

Some points in favor of the metallic cartridge type battery chargers are that they do not overheat. They are noiseless in operation and require very little attention to keep them in proper operating condition. Owing to this type of rectifier being subject to depreciation, it must be renewed occasionally.

In the practical operation of the trickle storage battery chargers most of the trouble experienced can be attributed to improper adjustment of the charging rate. The result of poor adjustment of a trickle charger is either an overcharge or an undercharge of the P. B. X. battery, either of which had an injurious effect on the operation of the battery. For a battery

which is on trickle charge 24 hours every day the current flow adjustment of the charging apparatus is very important.

The usual trickle charging rate of a P. B. X. storage battery is approximately 1 per cent of the battery's regular charge finishing rate. Insofar as the trickle charging system is designed to keep the P. B. X. battery fully charged automatically, its operation should be checked periodically until it is certain that the system is not giving too much nor too little charge.

If the cells gas continuously, the battery is receiving too much charge. If the specific gravity of the electrolyte in the cells continues to drop, the battery is not receiving enough charge. It should be understood that the battery is considered to be fully charged when during charging there is no further rise in either specific gravity or E. M. F., and that in any case a maximum value of E. M. F. and specific gravity should be aimed for rather than a final value.

When trickle charging a P. B. X. storage battery, one of the precautions to be observed is that reasonably good ventilation is provided for the battery and that pure distilled water is added to the cells at sufficiently frequent intervals to prevent uncovering of the plates.

New Number Board Picks Quick Workers from Slow.

A simple test to sort out slow workmen from fast ones and to distinguish those who will be likely to have accidents has been perfected by Dr. Kurt Seesemann of Mülheim, Germany, and was described at the recent meeting of the German Industrial Hygiene Society at Frankfort-am-Main. The only apparatus needed is a board or chart on which are printed in any random order the numbers between, for example, 1 and 50.

The person being tested is told to take a pointer and to touch in succession each of the numbers in proper order; that is, 1, 2, 3, and so on. Since these numbers may be scattered over the chart in any positions, the pointer must be moved quickly from one place to another. Meanwhile the examiner notes whether all of the numbers are touched in correct order and takes the time required by reading a stopwatch.

The test selects, Dr. Seesemann claims, persons who are quick and accurate in perception from those who are slow and inaccurate. Those of quick perceptions are found, on the average, to be quick workers in factory jobs and to have relatively few accidents.

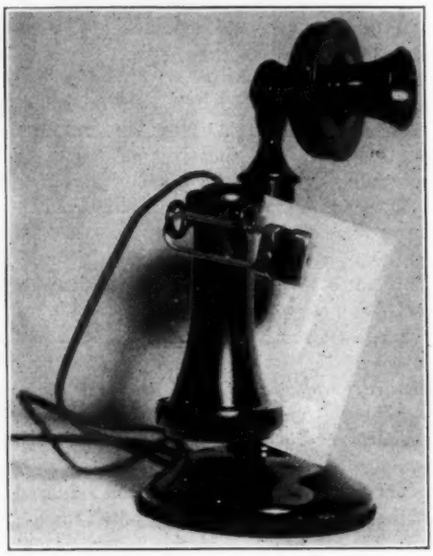
Those who do the number test slowly or inaccurately usually turn out, on the other hand, to be relatively slow and inefficient workers and to have more accidents than the average, probably because the time required for these individuals to coordinate eye, mind and hand is abnormally long.

"I Wonder Why" of an Observing Traveling Telephone Engineer.

By Ray Blain.

I wonder why someone has not provided the telephone with a suitable locking arrangement?

At the present time the telephone is about the only thing not lockable. The



This Padlocked Telephone on a Traveler's Aid Desk in a Railroad Station Waiting Room Can Not Be Used by Unauthorized Persons.

fact is that some do improvise a lock for the ordinary desk type telephone, for I found one on a traveler's aid desk in a railroad station waiting room which was padlocked tighter than a night club would be in Zion City.

I always thought that the holes in the ends of the switch hook were provided to drape the receiver cord through when the desk stand was being transported; but I found that it was really for the insertion of bicycle type padlock when it is necessary to lock the telephone to prevent its use by unauthorized parties. Anyway that was the use made of it in this case.

Most telephone companies will not restrict any of its telephones as to toll service; and when a subscriber is responsible for all toll originating on his telephone and cannot guard it constantly, then it seems that a locking arrangement may be desirable. When a lock is required it seems that a padlock is a cheap and effective means of locking the desk set or wall type telephone. If it is desired to lock one of the new type handset instruments, a pair of handcuffs will be required.

Robot Seeks Faults in Telephone "Mechanical Brain."

A mechanical and electrical robot that inspects the members of its family regularly to see whether any of them are out of order, and sends for the "doctor" if any sign of "illness" is discovered has been perfected by the telephone industry and is described by E. W. Flint in a recent announcement of the Bell Telephone Laboratories, in New York City.

This robot "health inspector" might be described, Mr. Flint notes, as the introspective or self-examining part of the "mechanical brain" which is the essence of the new dial systems for connecting different telephones with each other.

In the old days of direct human operation of the telephone system, each operator was continually on watch for anything going wrong on the lines and could call a repair man if needed. The dial system needs something of the same kind, and so the new robot tester was developed.

This device may be set in advance for a definite series of tests of each line and subscriber equipment in a telephone central or in several centrals of a system. The testing robot then begins tirelessly and methodically to apply these tests to each of the circuits for which it is responsible. If one of these circuits happens to be busy, the robot has "brains" enough to wait a few seconds until that line is clear or, if necessary, to call for help or to pass over the busy line altogether.

Whenever any fault is detected, the robot finds out just what that fault is and rings a bell or sets up a howl for the human repairman. If everything is correct, the robot gives each line in turn its O. K. until time comes for the next inspection.

Unique Case of Trouble Encountered by Texas Trouble-Shooter.

G. B. Strait, local manager for the Mid-West States Utilities Co. at Richardson, Texas, uncovered a unique case of trouble recently. The rural telephone at a country home, five miles west of town, refused to give a ringing connection and the crank of the generator box refused to turn. Upon opening the box to locate the source of trouble, he was amazed to find a colony of roaches.

According to Mr. Strait, there were big roaches and little roaches and plenty of eggs ready for a new hatch. The generator had become short-circuited, the crank gummed and the telephone put out of service by the roaches in seeking a new and safer home, after the householder had provided himself with an exterminator a few days previously.

Long Distance Construction Contemplated by Germany.

Among the long distance extensions which the German Post and Telegraph Department has under contemplation for the present year are a line between Leipzig, Chemnitz, Karlsbad and Cosel, on the one side, and Prague, Czechoslovakia, on the other, a connection with Poland by the Gleiwitz-Kattowitz line and a connection between Dusseldorf and Venlo, Netherlands.

Bookkeeper's Job From a New Angle

Accountant or Bookkeeper Urged to Keep Himself Posted on Pertinent Tax and Legal Matters, on General and Local Trends in Business and Finance—Address Presented at Southern District Meeting of United States Association

By C. E. Archer,
General Auditor, Peninsular Telephone Co., Tampa, Fla.

I take it for granted that all of us are keeping our books and accounts in a reasonably proper manner, and in dealing with this subject I am treating the bookkeeper and the accountant as one and the same person. I believe as R. B. Kester (an accountant of international reputation) does—he says that he does not know the difference between bookkeeping and accounting and doubts if there is any difference except in popular parlance.

I also agree with Allen B. Crunden, assistant comptroller of the American Telegraph & Telephone Co., when he says: "The aim of the accountant is to produce substantially correct accounting, within the maximum reasonable expense, or at the minimum expense, if you so choose to call it; and the expense of accounting should not be increased unduly in order to achieve a close and meticulous adherence to accounting theory."

We could discuss to the advantage of all of us, no doubt, the various phases of accounting, such as depreciation, revenue accounting, toll accounting, handling of insurance, plant accounting, methods of handling sinking fund, and many other subjects. I desire, however, to keep away from the dry theory of bookkeeping at this time, and instead to call your attention to some other matters I think will be profitable to an auditor or bookkeeper and to his company.

The auditor, I believe, should read carefully the trade papers of the telephone and related industries. He should keep informed upon income tax matters, especially the bulletins that are issued by the Income Tax department, and he should study telephone accounting continually as the art advances.

There are opportunities for plenty of work if he will keep posted on Interstate Commerce Commission tentative classifications presently to be permanently issued, and also the Interstate Commerce Commission's order on depreciation. In addition the accountant should keep advised with respect to legal decisions, particularly where they have to do with rate cases, franchise matters, income tax, and where inventories and percentages of return on investment are discussed.

He should keep himself informed as to the local trend of affairs and conditions, such as local finance, crops, local conventions, sporting events, and civic enterprises, for all of them may affect the company, especially in the preparation of budgets and estimates for future operations or expansion.

The accountant should likewise keep posted on the general trend of affairs throughout our country, as, for example, public finances, world news, the values of raw materials, etc. All of these things have an effect on the company, sometimes minor and ofttimes major, and while it is not the duty of a bookkeeper to define the general policies of the company, when these policies are formed he will work with a better understanding.

Doing Things While Others Receive Credit for Them.

You will be doing things for many years for which others will receive the credit.

Of course, your superiors bear the brunt of your failures as well as the glory of your successes. But you can school your very human ambition to achievement so that when you have done a brilliant task and get scanty credit, and see the plaudits go elsewhere, you can put the same zest into the next task.

That takes a man's greatest courage. And finally these men usually achieve authority and understand it that much better.—Rev. A. B. Kinsolving, Chaplain at West Point.

In my opinion, an auditor or bookkeeper should establish a statistical department to work in with the ordinary routine in the office and by all means prepare a budget, whether the company's policy requires one or not. He can do this for his own information, covering for example an estimate on stations, revenue, expenses, payrolls, construction program, collections, etc.

When the estimates are prepared, they should then be charted and the actual results for the year likewise charted. As the year progresses, the auditor should present these charts to the manager—and I can predict a prompt appreciation upon his part. I can speak from experience, that when a budget is made and charts have been prepared an immediate and favorable impression is created and all departments of the telephone company caused to respond.

From what I have said you may begin to realize that an auditor (even in these dull times) can keep busy and that he could create activity throughout the entire company's staff if he would undertake to create first in his office the spirit of cooperation. By the example in his office that cooperation spirit would extend to other departments—inspiring all employes to cooperate in carrying out the company's plan to increase its subscriber stations. It should, therefore, be the duty and privilege of the accountant to cooperate.

I am a firm believer in all that the word cooperate implies. Especially does cooperation apply to the telephone business, for I took the occasion to examine the definition of this word in the dictionary. I find it means "To operate together for a common object," and, in addition, cooperation is synonymous with mutual help and mutual aid. Truly, the telephone accountant has a wonderful opportunity to serve his telephone company through cooperation, if he will remember that cooperation helps all to work together for a common object.

The auditor knows that the bookkeeping depends upon the other departments, for many of the original entries that make up the company's report come from other departments. Therefore the bookkeeper is receiving aid from the other departments. The bookkeeper or auditor, however, is liable to consider that the facts assembled in the books or in the statement are his alone and not for those who have a right to know about them.

It is natural for the bookkeeper to think along this line, for he has assembled the facts that many times are quite dry reading to himself, but they may not be dry to others. This is the opportunity for the bookkeeper to step out and get into the picture. He can so prepare the results of his work as to make them attractive to others.

He has the opportunity to present facts and figures that may lead other employes to become interested in their particular work, and thus materially aid the company. I am sure if the bookkeeper will release his information (of course, to the proper officers and employes) beneficial results will immediately flow to the company.

In working along this very line I, personally, have seen expenses decrease, revenues increase, working with commercial office, public knowledge confirmed, and the company has proper and reliable information for confirmation. The stockholders are entitled to reliable information, the managers are entitled to it and certain other employes of the company would benefit

from it, with the result that the whole company would benefit.

The lesson to be drawn from what I have had to say is: Let us as bookkeepers and auditors get the spirit of cooperation I feel confident that our own work will become a pleasure and it would then be a pleasure for others to contact us.

Success.

It's doing your job the best you can,
It's making money, but holding friends
And staying true to your aims and ends;
It's figuring how and learning why,
And looking forward and thinking high,
And dreaming a little and doing much;
It's keeping always in closest touch
With what is finest in word and deed;
It's being thorough, yet making speed;
It's daring blithely the field of chance
While making labor a brave romance;
It's going onward despite defeat
And fighting staunchly, but keeping sweet;
It's being clean and it's playing fair;
It's laughing lightly at Dame Despair;
It's looking up at the stars above,
And drinking deeply of life and love;
It's struggling on with the will to win,
But taking loss with a cheerful grin;
It's sharing sorrow, and work and mirth,
And making better this good old earth;
It's serving, striving through strain and stress,
It's doing your noblest—that's Success!

Giant Telephone Poles Which Held Mississippi 3,000-Ft. Span.

When the telephone first crossed the Mississippi river at Burlington, Iowa, two telephone poles, the tallest ever placed in the territory of what now comprises the Northwestern Bell Telephone Co., were placed one on each side of the river. The pole on the Illinois shore rose to a height of 110 feet, while the pole on the Iowa shore was 85 feet high.

These exceedingly tall poles were spliced like the masts of sailing vessels, with cross trees, by men who had been Great Lakes sailors before they became linemen, for it took a combination of sailor and lineman to climb up these poles, twisting and stretching over the cross trees.

These two poles supported a single span of steel wire known as plow steel, the hardest and springiest wire that it was possible to obtain at the time. Later, this wire broke, and it was replaced with phosphor bronze wire.

The span between the two poles was over 3,000 feet, which is almost twice the length of the channel span of the Brooklyn bridge. The wire was not dead-ended on the spliced poles, but was passed over pulleys on these poles and carried back to second poles, where it was there wrapped two or more times round the bare poles.

Ultimately, the tall poles were taken down, but this was not done until permission to put the wire on the railroad bridge was obtained, and such permission could not be obtained at first—which accounts for the use of the poles for the crossing.

Repairman or Trouble-Shooter?

Some Differences Between Trouble-Shooter and First-Class Repairman—Trouble-Shooter Satisfied to Clear One Particular Trouble—Repairman Seeks to Obviate Future Interruptions

By John A. Bracken

In the performance of station maintenance work in a telephone system there is considerable difference between a so-called trouble-shooter and a first-class repairman. In the case of the trouble-shooter he, as a rule, equips himself with the fewest tools and repair parts he deems necessary. He is generally satisfied simply to "shoot" one particular case of trouble and then be on his way again, without making other repairs to the equipment or line circuit that may perhaps be needed.

To the first-class repairman, however, trouble, in telephone language, means any improper or unusual conditions or operations of the telephone circuit or equipment. It may be due to natural wear and tear, to accidental injury to the apparatus or wiring, or it may be due to improper handling by the user. The repairman is, therefore, very careful, first, to equip himself with all necessary knowledge applicable to his job; second, to obtain standardized specifications and other instructions furnished by his department, and, third, to secure proper and sufficient tools with which to work.

He obtains the necessary repair parts from the storeroom, such as wire, sleeves, insulators, dry cells, cords, receivers, receiver diaphrams, receiver shells and earpieces, transmitters, mouthpieces, condensers, induction coils, ringers, dials, desk-stand and handset bases, protector blocks, fuses and a miscellaneous assortment of screws and other minor parts.

The repairman, unlike the trouble-shooter, considers himself to be held strictly responsible for the clearing of trouble and general maintenance conditions of that part of the telephone plant in the district assigned to him. He constantly bears in mind that it is also his duty to prevent service interruptions as well as to clear trouble which may occur.

He finds that this can be accomplished by a very rigid or 100 per cent inspection of telephone circuit connections at cable terminals, drops, protectors, interior wiring, and subscribers' station equipment. For instance, when the repairman is on an assignment of instrument trouble, he examines the set for poor transmission, noisy cords, loose transmitter, broken or missing mouthpiece, loose receiver earpiece, bent, rusted or dirty receiver diaphragm, loose ringer or parts, loose connections, exhausted dry cells, etc.

If he finds cords worn or noisy, he replaces them. In this manner a "case of trouble waiting to occur" is avoided, thus preventing a possible complaint of unsatisfactory service.

If more than one case of trouble is assigned to him at this time, the repairman arranges to route them, first, according to the time which has elapsed since the report was first received; second, the geographical area, and third, the related order of importance.

The repairman remembers that the plant superintendent or wire chief is a very busy person and, although he may cover considerable of the outside plant on periodical inspections, many important details are apt to escape his notice. As the repairman, on the other hand, is thoroughly familiar with existing conditions in his territory, he takes pains to report any temporary or improper work on poles, wires, fixtures, cables, cable terminals, etc., to his supervisor.

As to the personal side of the repairman's daily work, he does not overlook the fact that every day cannot be a record day in locating and clearing trouble. He has what seems to be his unlucky day, but the next day may develop into a record-breaker. Very seldom does he find real cause for discouragement, and all of these experiences which he encounters in overcoming difficulties and making the good days offset the bad are the sort of experiences that are of great value to him in his work.

It is a source of gratification to the repairman to know that he and his fellow workers are helping to build and maintain "Ideal Telephone Service in the Community Served" and just how his part of the work affects that service proves to him a great incentive to better work.

The repairman may not be able to put on a clean shirt and collar each morning before going to work, but he can put on a bright smile and show cheerfulness in his voice when he speaks.

His working maxims are: Be pleasant every morning until nine o'clock, and the rest of the day will take care of itself. Be pleasant at all times, regardless of the kind of reception received from a subscriber who is perhaps angry. Exercise the proper amount of diplomacy and tact, and you will leave behind a favorable impression which will be working in his interest, and will do a whole lot toward making a friend for the telephone company.

Aim to win the full confidence of the public and the officials of your company in your ability to handle the job. The majority of us have to work for a living. However, if we work merely because we have to, there is little pleasure in our jobs, but if we accept our work as an opportunity to show skill in our line, to please the public and our company, then we know the real joy in telephone work.

Speed of Service on Long Distance Calls

Average Time Required to Complete Toll Call Is 1.6 Minutes Compared With Eight Minutes in 1926—Some Principles for Obtaining and Maintaining Speed of Service—Paper Read at Annual Traffic Conference of Illinois Association

By Catherine Byron,
Traffic Supervisor, Illinois Bell Telephone Co., Chicago

When we speak of speed of service, we are referring to the interval from the filing time of a toll call to the start of conversation or a definite report.

Toll speed of service as we know it today is quite different from a few years ago. In 1926, seven or eight minutes were considered as perfectly satisfactory, and no one would have thought of comparing toll speed of service with that of local and A-B connections.

Today, however, a speed of service on toll calls as high as two minutes on the average is considered as only partially satisfactory, and must have extraordinary local conditions to warrant it. Usually some special action is taken to discover the underlying causes and means of remedy if such a condition exists. The average for the Illinois Bell company at the present time is only 1.6 minutes, and no doubt there are many offices in your various territories where results are even better.

It is seen at once that we are quite rapidly approaching the local speed of service on toll calls, and with the use of the CLR method we are enabled to hold the customer on the line and thus gradually remove from his consciousness the idea that there is any essential difference in obtaining a local or a long distance connection. There is not the slightest doubt that the next few years will see many simplifications and improvements in toll practices which will reduce the speed of service on toll calls still further.

There are a few underlying principles to obtaining and maintaining a speed of service which I would like to dwell on for a few minutes.

Arrangement of Facilities.

One very important factor in securing satisfactory speed of service results is the adequacy and arrangement of facilities. The arrangement of recording trunks, toll lines and out trunk multiple, adequate position equipment and information and the provision of auxiliary information warrants particular attention.

Assigning Work to Line Positions.

The manner in which the various classes of work are assigned to the various line positions is of equal importance.

In the larger toll offices separate teams of operators handle inward, through, CLR, point-to-point and auxiliary work, while in offices of fairly good size, one team handles inward and through work and another team handles CLR and point-to-point work; and in the smaller offices one team handles all classes of work. Therefore, the arrangement of the classes of work depends, to a large extent, upon the size of the office.

In offices having from four to six toll positions it has been found advantageous, at least during the busy hours, to segregate inward and through work from CLR and point-to-point work and to combine auxiliary work with inward and through work.

In offices having more than six positions, and yet not of the large toll office type, it has been found advantageous to segregate point-to-point work from the other classes of work. This separation may only be warranted at certain hours of the day, depending largely upon the amount of delayed traffic handled at the office. Where such segregation of point-to-point work is attempted, it is always a good plan to overassign the point-to-point positions and have such operators handle some CLR work, in order to have at all times as large a team of operators as possible available for answering recording signals.

In many offices the toll auxiliary work is being performed at local information desks, while in many other offices it is performed at inward toll positions in each case with satisfactory results.

Information at Various Positions.

The prompt handling of toll calls is dependent largely on the facility with which the desired information necessary to advance a call can be obtained. It is important that the requisite information be provided at the different positions since its absence results in the necessity for recourse to other sources, thus causing delay in the completion of the call.

CLR and point-to-point positions should be provided with a list of frequently-called points with the necessary routing information and rate information if space permits. If separate positions are provided for auxiliary work, CLR and point-to-point operators should be provided a means of reaching auxiliary operators for information not posted at their positions. Usually a trunk is provided to be used for this purpose.

Auxiliary positions should be provided with the necessary rate and route books and directories for furnishing rate, route and directory information. The information posted at auxiliary positions in addition to being accurate, should be so set up that the desired rate and route is easily found and easily read. A list of the most frequently-called points, not posted at the CLR positions, arranged for quick reference should be posted at auxiliary positions so as to facilitate the furnishing of rate and route information. The points to be included in this list may be determined from a two or three weeks' record of the requests for rates and routes.

While rate and route books are referred to only occasionally it is important that they be arranged and indexed to make reference to them as simple as possible. Some offices have combined the Long Lines block route book with the Long Lines lists of stations, and have found it helpful in furnishing routing information quickly.

Inward positions should be provided with a list of frequently-called numbers to be used in connection with the completion of address name calls.

Force Conditions.

The conditions of the force is another factor of major importance in the obtaining and maintaining of satisfactory speed of service. Attention to the selection of new operators to insure that those selected are fitted for operating work is essential.

The supervisory force should understand that their most important function is the development of operators. It is also essential that adequate force be provided at all hours of the day or night. Particular attention should be paid to the provision of evening and night forces.

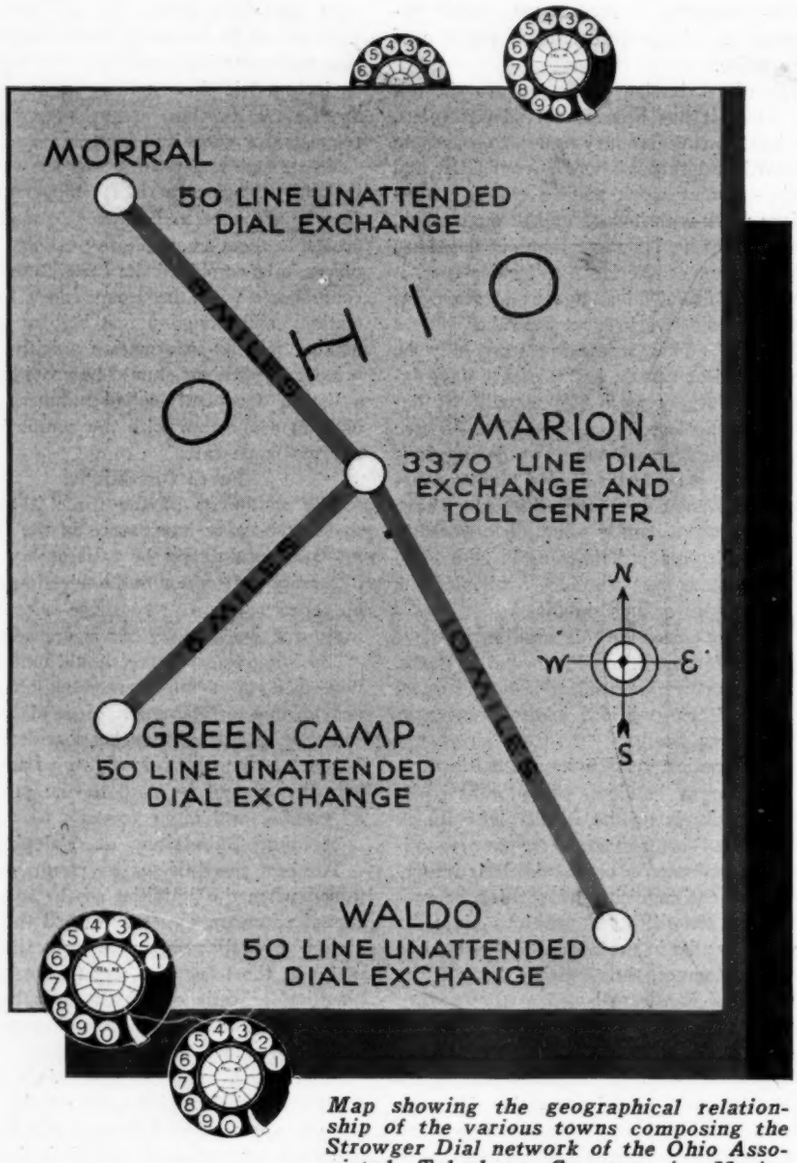
Holding Subscriber at Telephone.

The best speed-of-service results are obtained when the activities of the toll office organization are directed toward the completion of calls while the subscriber remains at the telephone, and to the prompt handling of calls on which the subscriber has been released, and calls that are not completed on the first attempt.

Since the advantages realized from the CLR method depend largely on the number of calls advanced immediately following the recording of the call, it is desirable to extend the CLR method to include all calls except those requiring special handling, such as appointment and messenger calls, calls on which the charge is to be transferred, and sequence calls where there are five or more calls in the sequence.

The operating practice provides that the patron should be held on the line when there is a likelihood of completing the call or obtaining a report without undue delay. Failure to hold the patron when the call can be completed limits the application of the CLR method. Holding the patron too long or too often when no report can be

CENTRALIZED SUPER
—The Mod



Map showing the geographical relationship of the various towns composing the Strowger Dial network of the Ohio Associated Telephone Company in Marion County.

THE Marion County dial net[work] of the Associated Telephone Compa[ny] as an excellent example of the modern tre[nd] centralized supervision. Here the oper[ating] for the area are concentrated at [one] with added efficiency, increased econ[omy] and effective control that such a plan [can] produce.

This plan can easily be applied [to] small exchanges—even two adjacent [ones] profit adopt this modern scheme. Ordinarily the largest or most centrally located [office] is used as the operating center. Here is concentrated toll [service] which also handles information and [special] service for the group. All other exchanges are connected on unattended dial basis.

Hundreds of telephone organizations [all] over the world are finding this method of [operation] results in many unexpected small economies [as well] as very large ones. The result—even [on a] profitable basis—modern, twenty-four [hour] service in each exchange area—more effective control and supervision throughout the network. [WRITE] TODAY giving full details of your exchange [and] let our engineers show you how the [operation] can make money for YOU.

[*This is one of a series of advertisements illustrating the application of Strowger [automatic] to telephone exchange [service]*]

STROWGER AUTOMATIC DIAL SYSTEMS

GENERAL EXPORT DISTRIBUTOR
The Automatic Electric Company, Ltd., Chicago, U. S. A. and Antwerp, Belgium
In Canada · Independent Sales and Engineering Co., Ltd., Vancouver
In Australasia · Automatic Telephones Ltd., Sydney
In Japan · Automatic Telephones Ltd. of Japan, Tokyo
In China · Automatic Telephones of China Federal Inc., U. S. A.
In South Africa · Automatic Telephones (South Africa) Ltd., Johannesburg

When communicating with Automatic Electric Inc., please mention TELEPHONY.

RISION
d Method

...he Ohio
...as an ex-
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Above: The Beautiful Exchange Building at Marion, Ohio.

Views of the 3,370 lines of Strowger Dial Equipment which serve the patrons of the Ohio Associated Telephone Company at Marion, Ohio

Automatic Electric Inc.

Manufacturers of
Strowger Automatic Dial Telephone and Signaling Systems
Factory and General Offices: 1033 West Van Buren St., Chicago, U. S. A.

ASSOCIATED COMPANIES
American Electric Company, Inc., Chicago
International Automatic Telephone Co., Ltd., London
Automatic Telephone Manufacturing Co., Ltd., Liverpool
The New Antwerp Telephone and Electrical Works, Antwerp
Eugene F. Phillips Electrical Works Limited, Montreal

When communicating with Automatic Electric Inc., please mention TELEPHONY.

obtained is annoying and is apt to encourage subscribers to hang up instead of waiting for a report.

The best balance between these two tendencies is obtained by close adherence to the operating practice and by developing the operator's judgment as to when to hold and when to release subscribers. We wish to stress the point, however, that special studies and our experience with the CLR method indicate that the cases of failure to hold subscribers on the line, and for the proper interval, far outnumber those of holding the subscriber too long.

When a subscriber is released before his call is advanced, there is a tendency for the operator to delay the advancement of the call over the toll line. Operators should be taught to proceed with the toll line work under this condition just as promptly as if the subscriber had remained on the line.

Special Studies.

In order that satisfactory speed-of-service results may be secured and maintained, it is essential that those in charge of the office keep thoroughly informed regarding the speed-of-service performance. A study of the toll tickets to determine the percentage of calls on which the subscriber was held, the percentage of calls with speed of service within three, five, and ten minutes, the speed of service on calls on which the subscriber was released and the overall office speed will ordinarily be found adequate for supervisory purposes.

At an office at which an average overall speed of service of 1.6 minutes is contemplated, the percentage of calls with speed of service within three minutes should be approximately 87, within five minutes it should be approximately 95, and within ten minutes should be approximately 99.

Where the speed of service is satisfactory, attention should be directed toward an improvement in the percentage of calls on which the subscriber is held for this item holds the source of the greatest possible improvement.

Failure to hold the subscriber at the telephone may be due to one of the following reasons:

(1) Operators are slow in advising the calling party either to hold the line or that he will be called. The promptness with which this advice is given depends upon the operator's familiarity with the information posted at her position, or upon her ability to obtain it quickly from the bulletin or other sources. Very often under this condition the operator releases subscribers on calls on which they should be held on the line.

(2) Failure to adhere to the operating practice on calls encountering NC. This includes failure to use alternate routes, failure to hold the subscriber at the telephone for the prescribed interval, which is one minute, and failure to devote undivided attention to securing a circuit during this interval.

Progress Measured Partly by Object of Utility and Comfort.

I do not belong to those who are scornful of telephones, telegraphs, radios, automobiles and bathtubs as marks of progress, for I regard them as such not as things in themselves, but because they further human comfort and make life more possible for many people, and because they raise the tone of the race as a whole and promote interrelation between peoples.

The real marks of progress in the world can only be measured by the amount of gentleness, kindness, mercy and justice in our civilization.—Dr. Frank Day, President, Union College.

(3) Failure to allow the subscriber to hear all the operating work performed. This is essential in order that the subscriber know that his call is being advanced, and it very often helps in a faster completion of the call.

(4) Slow or inaccurate auxiliary work. Slow rate, slow route, or slow directory work have a marked effect on the percentage of calls on which the patron is held.

(5) Low percentage of calls filed with called number. The furnishing of the called number by the toll user results in a faster speed of service; therefore, it is important that we develop the use of the called number by toll users in placing their calls.

Some of the activities that prove helpful along this line are: Asking the calling party if he knows the called number when he places his call; holding the subscriber on the line while obtaining the number from the directory operator, if this can be obtained within an interval of one minute; giving the calling party the called number when completing the call, except in those cases where he has been permitted to hear the work of the operator in obtaining the number from the directory operator; and furnishing lists of frequently-called numbers to subscribers.

(6) Inefficient operating. This includes operating technique, poor position management and failure to adhere to the operating practice. In this connection, illegible, inaccurate and incomplete recording work seriously interfere with the efficient handling of traffic.

(7) Releasing subscribers to answer recording signals. While it is recognized that the speed of answer on recording signals is important, it should be kept in mind that this procedure results in an overall service which many subscribers consider less satisfactory. The release of subscribers to safeguard the recording answer should ordinarily be resorted to only as an emergency measure, after all other available steps have been taken to meet the situation and have been found inadequate.

(8) Failure to use overlapping operations very often makes it necessary to release the subscriber without a report at the expiration of the time allowance for holding him on the line. Operators should be trained to perform such items of work as selecting and taking up toll circuits, selecting a trunk to the directory or route operator, entering route and rate information on the ticket, ringing, and completing ticket records, as overlapping operations.

(9) Calls passed to the toll center by tributary operators on which the calling party has been released. It is desirable to provide subscribers in tributary offices with as good service as that received by subscribers at the toll center insofar as this can be accomplished at reasonable cost. Today the subscribers at several tributary offices are receiving CLR service on calls passed to the toll center. In these offices one of the following methods is being used:

Under one plan, the subscriber at the tributary office is directly connected with the proper operator at the toll center, who records the call and makes attempts to complete it while the subscriber remains at the telephone.

Under another plan, the tributary operator records the call and then asks the calling party to hold the line. She reaches the proper operator at the toll center and passes the call to her within hearing of the calling party, adding the word "holding" to the order. The toll center operator makes attempts to complete the call, holding the subscriber meanwhile.

(10) Unsatisfactory work at other offices. Unsatisfactory inward and through service usually is less apparent than a similar condition on outward, but more for reaching in its adverse reaction on the toll service as a whole, because it affects all offices with calls to or through the office responsible.

This is usually manifested in slow answers to first and subsequent signals, operators' failure to concentrate on the order passed by the calling office, making it necessary to pass the order a second time, operators slow in establishing connections, failure of the operator to remain on the line, operator slow in furnishing or failing to furnish the called number on calls passed by address name.

Improvement in the speed of service on calls on which the subscriber is not held, more particularly involves management and supervisory activities. This includes proper provision and use of alternate routes, the accurate fitting of operating forces to traffic conditions, and careful follow-up of delayed calls.

Multi-Switch Calls.

Through the use of special operating practices, the speed of service on multi-switch calls has improved considerably within the last year, but there is room for

further improvement in the speed of service on this class of call.

Close adherence to the special multi-switch practices providing for the through operator to monitor until the call is acknowledged by the inward operator; for the outward operator to stay on the line following the passing of an NC call order; for the inward operator to assist until the start of conversation or final disposition of the call, will reduce the operating use of toll lines and to that extent improve the speed of service.

The promptness with which "No Circuit" call orders are completed at the intermediate office is an important factor in maintaining a good speed of service on multi-switch calls.

Team Work.

Team work cannot be overlooked at any office, if speed-of-service results are to be satisfactory. Operators should be taught to realize that they are part of a team and whenever possible should share with one another the responsibility for performing work that is available on the adjacent positions.

Examples of cases where assisting adjacent operators are in order are: Answering line signals; reaching for tickets on adjacent positions; quoting time and charges; disconnecting, and advancing calls when a circuit becomes available following NC.

While some of the items which have been given consideration here may seem to be in the category of ancient history, it is to be remembered that it is only by repetition and the proper application of these principles that we are able to put them into the consciousness of the people doing the job and thus bring about the results desired.

Once they are mastered by an operating force, the desired response will be received and improvements brought about that sometimes seem impossible. It takes continual effort to bring about and maintain the inspiration of the forces to produce satisfactory results.

Telephone Cables in San Francisco Bay Being Moved for Bridge.

Thirty-three picked men started June 30 on a three months' job, working day and night, to move from the path of the San Francisco Bay bridge 12 telephone cables, with peak capacity of 270,000 words a minute. When this, one of the world's largest bridges, puts its pier-feet, broad as city blocks, into San Francisco Bay, it will need the space now occupied by the telephone cables.

The cables will be moved 1,000 feet north, to cooperate with the state and prevent delay in bridge borings. Extraordinary precautions will be used in moving them since they carry the conversation, radio programs, stock quotations and news of a million bay people and of other millions throughout the coast. They carry calls to the East, Europe and South America.

Extra "stand by" cables will be ready for instant hook-up, in case the regular lines are damaged. On the San Francisco side of the bay the submarine cables land in a loading house located at the Ferry Building. The cables land on the east side of Yerba Buena Island, which is approximately in the center of the submarine route between San Francisco and Oakland, and land at a point on the Oakland Mole adjacent to the Southern Pacific Railroad terminal.

The photograph shows the submarine cable terminal on the Oakland side. When it was taken only nine cables were installed (there being 12 now). The distance between the Ferry Building in San Francisco

Submarine Telephone Cable Under San Francisco Bay at the Oakland, Calif., End.

and the loading manhole in Oakland Mole is approximately 21,000 feet, with Yerba Buena Island almost exactly at the midpoint.

The moving of these cables is an emergency job, costing $130,000, says Lyle M .Brown, division manager of The Pacific Telephone & Telegraph Co. The picked crews, working in three shifts, will use a fleet of ten boats, two deep-sea divers, a life-saver, and a squad of seven former navy men trained in continental code signaling, to keep 24-hour contact with telephone headquarters at 140 Montgomery street, San Francisco.

The divers' work will border on the spectacular. One hundred feet under water, they will direct the washing of water from a nozzled three-inch hose, to enable the lines to be moved without injury. The hose will connect with a high pressure pump on the telephone barge "Pacific." In places the mud is 15 feet deep.

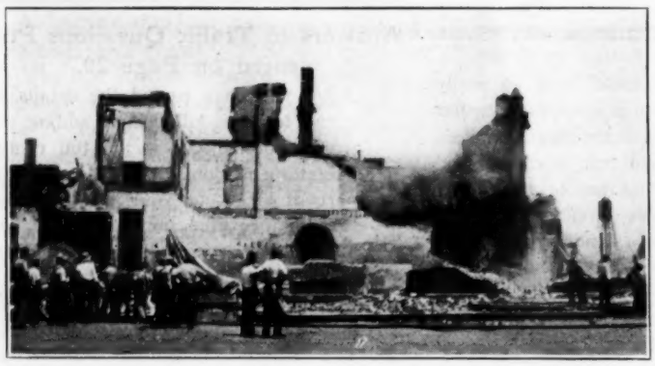
A giant electrical "detector," specially built by the telephone company, has already located the cables buried in mud. The locations are now charted on a map, the charting being done to prevent delay when the night-and-day job began.

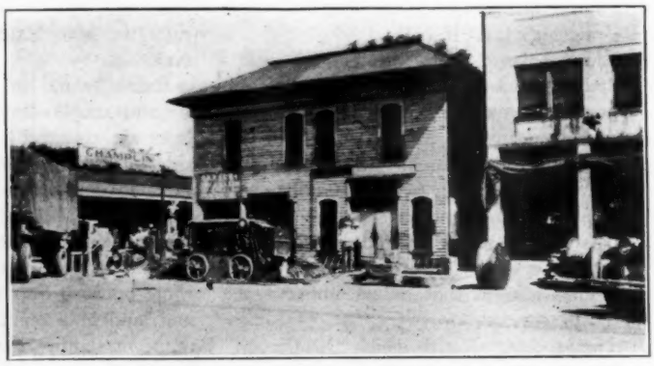
Code signaling between the barge and the 26-story telephone building is one of the vital phases of the work. Instant word of damage to a cable must be flashed between Division Construction Superintendent F. O. Edmunds on the barge and land headquarters. Signal lamps equipped with a code key will be used.

Extreme accuracy was essential in the cable charting, which was done with sextants, telephone receivers, amplifiers and the "detector." The detector, three feet long and connected to the company's special barge with the telephone wires, was dragged across the bay bottom hundreds of times. Each time it came near enough to a cable the electric lines of force emanating from the cable cut through the

Answers to Traffic Questions Presented on Page 20.

1. After you have passed the details of a call to your toll center, adding the word "holding," it is the toll center operator's responsibility to give a report of delay to your subscriber at the end of three minutes if she has not reached the called station or party, saying, "I am sorry, there will be a slight delay on your call. Will you hold the line or shall I call you?
2. The Illinois Telephone Association plans on having from one to three district meetings a month, beginning in April or May and ending in September. These meetings are held in different parts of the state so that all companies operating in Illinois will have an opportunity to attend at least one of the meetings during the year.
3. On a call that is made collect after conversation, we call our subscriber and tell him that the charge is OK. It is not necessary to do so on any other class of call unless our subscriber requests this information.
4. It sometimes happens when we leave word on a call, that the called party instead of reporting ready to talk, places a call for the calling party. When the call comes through for the calling party's number, the originating toll center operator is not permitted to challenge the call; she must ring the number. If it develops that this call covers her call, she will make the notation, "cov. by in," on her ticket; and if a report charge has been incurred, she will enter, "no report charge" and file the ticket with her cancelled calls.
5. CLR service can be improved at the tributary office by asking the calling party to hold the line on every call where it is possible to give CLR service; by permitting the toll center operator to deal directly with your subscriber; by permitting your subscriber to hear you advance their call when you are working on your own circuits; and by receiving prompt service and cooperation from your toll center.





View Showing Remains of Spencer, Iowa, Central Office of Northwestern Bell After Fire Started from Explosion of Fireworks in Drug Store Below Had Taken Its Toll—Temporary Telephone Headquarters Were Established in Garage Building.

windings of the detector causing a "zip-zip" sound to be sent up the telephone wires to the barge, where a man sat with a head receiver on.

Upon hearing the maximum "zip-zip" he signaled two men working with sextants. One man took the angle made of their location by imaginary lines to the flagpole on the telephone building at 140 Montgomery street and a flagpole on Telegraph Hill. The other man simultaneously took the angle between Telegraph Hill and Alcatraz light. A fourth man marked the spot on the map.

To determine how deeply a cable rested in mud, the volume of sound in the detector as it was dragged across the bottom was recorded, at distances from 1 to 70 feet. A certain volume of sound meant so many feet in mud.

The man with the head receiver on the barge not only hears the "zip-zip" in a cable with 600 pairs of wires, for instance, but he hears also at peak load 1,200 voices speaking 60,000 words a minute—equal to eight newspaper pages of solid reading matter. But he cannot distinguish a word!

Fire Destroys Business Section; Employes Quickly in Action.

Three telephone operators and two men escaped by ladder from a window of the second floor central office of the Northwestern Bell Telephone Co. at Spencer, Iowa, June 27, in a fire which started from an explosion of fireworks in the drug store beneath the central office. Only a few minutes after a small boy dropped a lighted sparkler among the fireworks, the floor of the central office gave way and the switchboard and other equipment plunged into the flames.

The chief operator, Miss Marie Banning, and six girls were on duty when the first blast shook the building. Four of the girls were told to leave at once and raced down the front stairs to safety. Miss Banning and the two other girls, Bertha Harriman and Alene Knudson, sent out fire alarms, while plant department employes opened windows on the side street and seized plant records of the exchange.

View Showing Destruction Wrought by Fire at Spencer, Iowa, Which Destroyed Telephone Office and Other Property in City's Business Section Estimated at $2,500,000.

Heavy smoke surged up the stairway, and wisps were curling up from the floor when the ladder was thrown up to the window. The three operators climbed down; then the two men, Kenneth Billings and Roy Eastland. A short time later the floor collapsed.

Meanwhile E. E. McNeeley, section lineman, rushed to a terminal box on the long distance cable, called surrounding towns and told them of the fire. He also notified the telephone district office at Sioux City. Magneto telephones were quickly installed in three filling stations in different parts of the city, and long distance calls were made for aid in fighting the fire. Several surrounding towns and cities sent fire trucks to Spencer and dynamite was brought by airplane to help stop the spread of the flames.

The fire raged six hours and destroyed 75 offices and places of business in the main business section of Spencer, causing property loss estimated at $2,500,000.

Preparations to restore service were started as soon as Mr. McNeeley telephoned to Sioux City that the central office was doomed. Less than five hours later, the first truck load of replacement equipment left Des Moines. A second truck from Des Moines, another from the Western Electric Co. warehouse in Omaha, switchboard installers from Sioux City, Waterloo, Mason City and Cedar Rapids,

THREE LITTLE WORDS

By Miss Anne Barnes,

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

Three little words—"I don't know." How often we silently voice them! How very careful we are not to speak them at times, in a conference, for example. We sit there and hope someone else will, so that we may find out what we want to know, without disclosing our ignorance. If no one voices our "don't know," we close up a little tighter because we think likely we are the only folks in the room who do not know; *fear of exposure.*

We allow it to come between us and helpful information. We shield our ignorance behind a wall of fear.

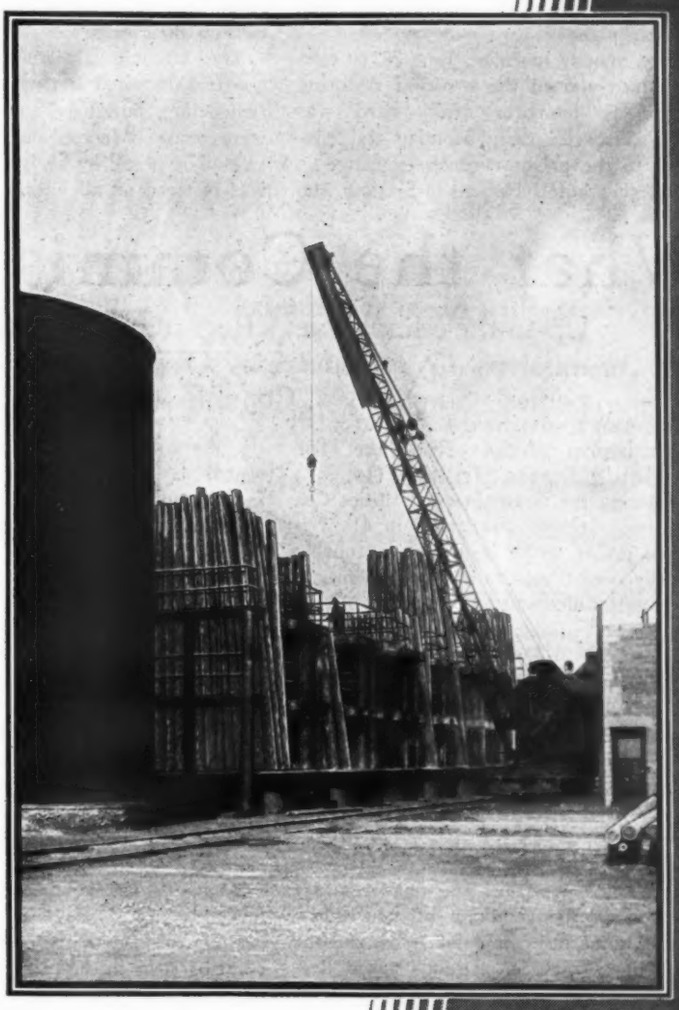
We say to ourselves, "I wouldn't mind saying 'I don't know if those Crystal City girls were not in the conference.'" Perhaps the Crystal City girls are thinking the same thing about us. We might be surprised if we could read their minds.

Another thing which occasionally keeps us from voicing "I don't know" in a conference—jealousy. Let us be honest with ourselves. Isn't it true that we would sometimes rather go out of a conference "don't knowing" than allow certain ones to help us?

"I don't know but I wouldn't ask her. She thinks she knows it all since going to Crystal City to work"—and we slam the door of our mind tight.

Moral: An intelligent open mind is one that has grown so by never closing because of jealous and fear feelings. Nosiree! Make yourself able to say those three little words, "I don't know" in conferences, or anywhere else.

Why GUARANTEED SATURATION assures longer life of "P&H PROCESS" POLES



UNDER laboratory conditions, the 72% air content of Cedar poles can be replaced with creosote to the extent of 45 to 50 pounds per cubic foot of sapwood in the groundline area (saturation to refusal).

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The new "P & H" standards of guaranteed saturation **and** penetration achieved in "P & H PROCESS" Poles, are contributing to their dominant position in every field of overhead transmission.

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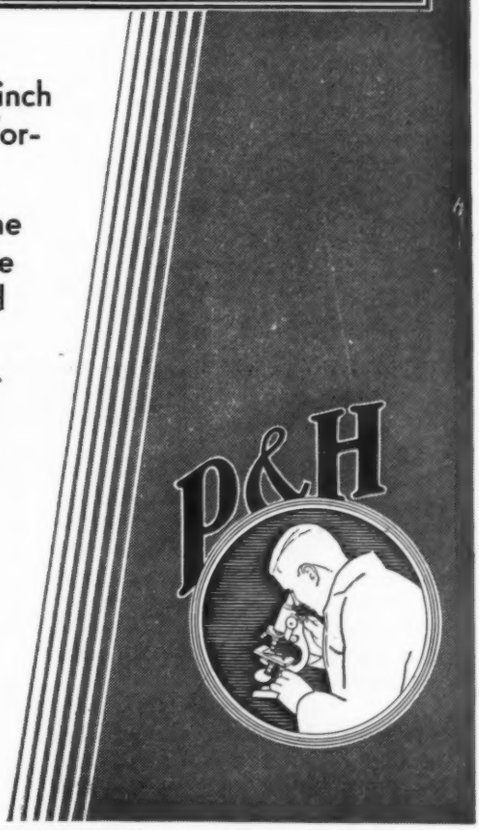

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Boston, Mass., 733 Public Service Bldg. Kansas City, Mo., 801 Dwight Bldg.
Pittsburgh, Pa., 1210 Grant Bldg. Dayton, O., 854 Reibold Bldg. Omaha, Neb., 711 Elec. Bldg.

cable splicers and two construction crews, all were on their way to Spencer early Saturday night.

Early Sunday morning, June 28, 60 telephone men started the work of restoring service. A temporary toll board was placed in service early Monday and connected to the private branch exchange in the Tangney hotel. Persons in Spencer who were called by long distance were summoned to public telephones in the hotel to talk on their calls.

The building available for temporary quarters required a new floor and other remodeling, but by Thursday local lines were being connected to the temporary switchboard and by early Saturday service was restored on all lines.

The population of Spencer is about 5,000 and before the fire the office served about 1,990 telephones of which 1,400 stations were in the town.

Spencer is an important point in the long distance system in this part of Iowa. A large part of the loss in telephone property consisted of new repeater equipment which had just recently been installed.

What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Commission Asks Receiver for South States Utilities Co.

Declaring the South States Utilities Co., operating telephone exchanges in 41 Mississippi towns, to be insolvent and unable to make needed repairs and improvements, the state has filed suit in Lee County Chancery Court asking that a receiver be appointed.

Arguments on the petition for a receiver were scheduled to be heard by Chancellor J. A. Finley at Tupelo July 13, according to the office of Attorney General George T. Mitchell, who filed the petition at the instance of the Mississippi Railroad Commission.

The company was ordered on April 9 to make necessary repairs and improvements on its lines, the condition of which had brought numerous complaints from patrons of its lines. Several petitions asked that the company be made to put its lines in condition or discontinue service.

The Mississippi Railroad Commission, after a hearing, gave the company 60 days in which to put its lines in first class condition, and to make a report to the commission showing that the work was under way and that it was financially able to complete it.

At the June 9 meeting a report was made, but the commission later declared the report to be unsatisfactory in that it did not show any general betterment of service and that its financial statement did not indicate that it could complete the work needed. The commission authorized the attorney general's office to file a petition for a receiver.

The petition points out that the lines of the company are in such bad shape that many must be replaced entirely, while practically all lines and exchanges need extensive repairs. The firm owes considerable money which it is unable to pay, or has not paid, and does not have adequate finances for making needed repairs, the petition sets out.

Arguments on Information Demanded in Michigan Bell Case.

Legal arguments to determine how much information the state may demand from the Michigan Bell Telephone Co. were presented before Wm. S. Sayres, standing master in chancery in the federal court at Detroit, during the week beginning July 13, in the long drawn out fight of the company against rate schedules established by the Michigan Public Utilities Commission.

Of the 59 requests for information made by Harold Goodman, special assistant attorney general, Thos. G. Long, counsel for the telephone company, has agreed to supply 37 in full and 17 in part. The 17 items fall into the three classifications—unit costs to the A. T. & T. in the manufacture and furnishing of each kind of equipment to subsidiaries, records of non-telephone subsidiaries, and handbooks.

Regarding the handbooks, Mr. Long contended before Master Sayres that they have nothing to do with the costs which are the point of issue in the case. He said he will put his case on the basis that the telephone company is an individual company and not merely a department of the American Telephone & Telegraph Co., and that its tariffs are fair.

The remaining five requests he refuses to accede to on the grounds that they are irrelevant and highly expensive to prepare in the proper form. The latter include requests for records of Western Electric non-Bell business, minutes of the board of directors of the American Telephone & Telegraph Co. since 1916, conference minutes and forecasts of the A. T. & T. and the Western Electric Co. since 1916.

Mr. Sayres has indicated that arguments will be heard separately on each of the 17 items of evidence where there is controversy between the state and the telephone company regarding admissibility, and that he will give a written opinion in each of the arguments.

Percy L. Lovett, on July 13, entered his appearance as co-counsel, with Mr. Long for the Michigan Bell Telephone Co.

Service Complaint Against Black River (N. Y.) Company.

The New York Public Service Commission has ordered that the proceeding relating to the service furnished by the Black River Telephone Co. in the Old Forge, Eagle Bay, Inlet, Raquette Lake, and Blue Mountain territory be closed on its records.

The commission closed the proceeding after it had been shown that the company had completed a program of improvements in its equipment and system in order to render adequate and satisfactory service in its Adirondack territory. From about the middle of 1927 to the first of 1931 the company expended in the improvement of its service, mostly in the Adirondack region, an amount in excess of $125,000.

In 1929 the commission issued an order requiring the company to show cause why it should not be required to improve its service and to make changes in its plant, equipment and methods of operation as might be necessary in order to assure that proper service be rendered to the public.

After a hearing had been held the company was asked to submit to the commission a program of the improvements to its plant and equipment which it would carry out in 1930. The program was filed, and with some changes made at the suggestion of the commission the work was agreed upon. The improvements set forth have been made and the work has been entirely completed. In view of these facts the commission issued an order closing the case.

All of the improvements and changes except the provision of standard submarine cable were made prior to the opening of the 1930 summer season.

Wisconsin Legislation Proves Greater Rule Over Utilities.

Far-reaching and radical measures are said to make up the program of legislation adopted by the Wisconsin legislatiure recently adjourned. Resembling in parts the utility laws of Ontario, New York and the states of the Pacific Northwest, it goes much further than they in restricting the scope of private utilities and furthering the interests of public ownership.

One resolution, just passed, relates to the recapture of the water power in the state and permits the state to engage generally in the creation, transmission and distribution of power. The resolution, which must

(*Please turn to page* 43.)

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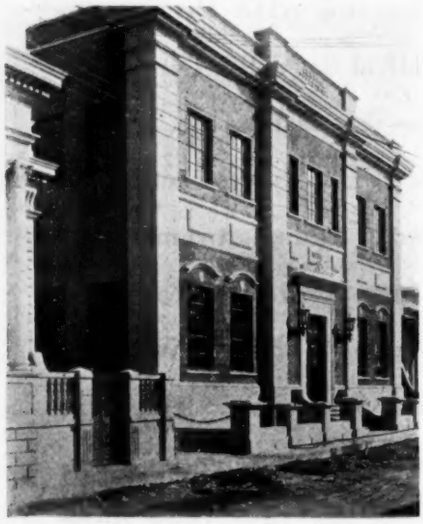
First Dial Exchange in Colombia, S. A.

Barranquilla, Second Largest City of Colombia, South American Republic, Installs 3,000 Lines of Strowger Automatic Dial Equipment in Handsome New Telephone Building of Fireproof Construction—Toll Board Also Provided

By A. H. Hackett,

Engineer, Compania Telefonica De Barranquilla, Barranquilla, Columbia, South America

The second largest city in Colombia, South America — Barranquilla — has the honor of being the first city in the republic to convert its telephone system to dial operation. On midnight of April 18, 1931, 3,000 lines of Strowger automatic equipment were cut into service, providing up-to-date service to approximately that same number of telephone users.



Beautiful New Telephone Building of the Compania Telefonica de Barranquilla, at Barranquilla, Colombia, South America.

The new equipment, as well as the commercial offices and toll board, is housed in a handsome new telephone building. The Compania Telefonica De Barranquilla is to be congratulated on this excellent new building, which is of fireproof construction throughout and highly attractive in appearance. It is two stories in height, with square-faced columns running the entire height of the building to join the decorative cornice treatment above.

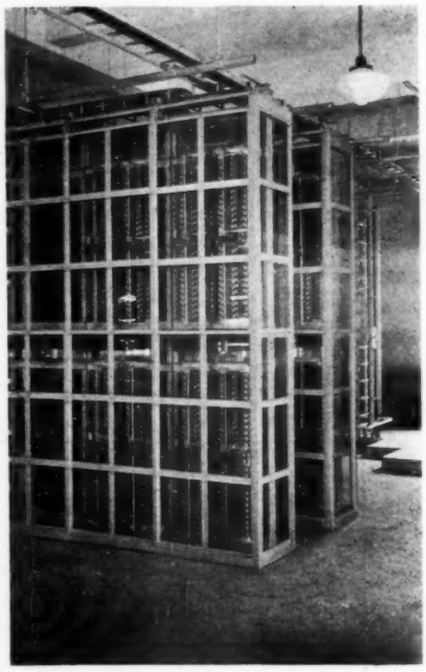
The whole structure is set back several feet from the sidewalk line, the intervening space being fenced off with decorative corner posts fitting into the general design of the building and serving to set off the short flight of steps leading to the main doorway in the center of the building. This main doorway is framed with a portal of classic pattern, relieved on either side by electric lighting fixtures of wrought iron and opaque glass.

The new telephone building and Strowger dial system is in keeping with the importance of Barranquilla. With a population numbering over 100,000, this city is second in Colombia only to Bogota, the capital. Within a few miles of the Atlantic Ocean, Barranquilla handles a good share of the freight to and from foreign ports, which passes through it as a trading center.

A short railroad now connects Barranquilla with the port, but it is anticipated that before long the Magdalena River, which flows through Barranquilla to the ocean, will be enlarged to allow sea-going vessels to come directly into the city. This river is navigable to good-sized river craft for a considerable portion of its length, and consequently is used a great deal for the reshipping of all sorts of commodities to various points in the interior of the country.

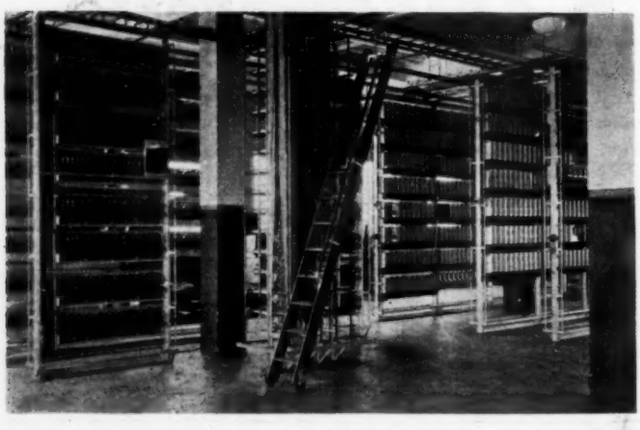
All of this commercial activity has added to the importance of Barranquilla, and has caused many large trading concerns and business enterprises to make this city the center of their activities.

The confidence of the Compania Telefonica de Barranquilla in the future of the city is indicated by its extensive program of improvement and modernization. Under the direction of C. T. Cavan, local manager, and with the assistance of Mr. Viets and Mr. Gasser, the outside cable plant has been largely rebuilt.



Strowger Self-Aligning Plunger-Type Line Switches at Barranquilla.

All aerial cables in the business district are now being replaced by underground construction, using either ordinary cable laid in ducts or specially armored cable laid directly in the ground. A certain share of this work was completed before the cutover, but the remainder of the cable



General View of Strowger Dial Switchroom at Barranquilla, Colombia, South America—Power Equipment in Barranquilla Exchange.

IMPACT TEST

PITTSBURGH TESTING LABORATORY
PITTSBURGH, PA.

LABORATORY No. 146508
DATE: DEC. 3, 1930

Report of Test on: NATCO 3½" ROUND BORE SINGLE DUCT CLAY CONDUIT
For: NATIONAL FIREPROOFING CORPORATION

IMPACT TEST

	Number of Impacts	Energy Absorbed Foot Pounds		Remarks
		Final Blow	Total	
Maximum	5.	7.0	27.3	No damage till third blow. Failure by breaking out of fragments from edge and cracking
Minimum	3.	5.4	14.1	Similar to Other group
Average	4.2	6.4	22.1	

(Note: *Conduit specimens were clamped in a vice in the testing machine, and the impact delivered by a rounded hammer, swung on the end of an arm—the combined effective weight being 8.63 pounds. The hammer was allowed to swing against the specimen until failure occurred, being raised to a higher point with each successive blow. Energy ranged from 4.0 foot pounds for the smallest hammer travel up to 19.0 foot pounds for the greatest.*)

Natco Multiple Duct Clay Conduit for Telephone Cables in South America.

FIELDS OF USE

FOR

Telephone cables

IN

Local exchange systems
Telephone exchange buildings
Telephone toll lines
Toll line repeater stations
Under city streets
In subway structures
In elevated highways
In bridges and viaducts
In R. R. terminals
In submarine crossings
In riser walls

The safe transportation and handling of conduit is one of the many factors to be considered in selecting this material.

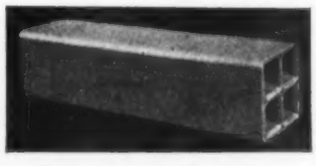
All conduit in its movement from place of manufacture to the place of use, is necessarily exposed to the usual shipping and handling hazards, consisting of bumps, jolts, blows, falls, shock or impact; all of which may be intensified by rough or careless handling. The ability of conduit to meet these conditions and to escape injury is naturally of interest, aside from its ability to meet the more important service requirements successfully.

One or two forms of conduit are, by nature, highly resistant to the effects of shock or impact. Their usage, however, is limited on account of their inability to successfully meet more important service requirements. On the other hand, the more widely used forms of conduit are all more or less susceptible to shock or impact, though not to any great extent. This characteristic, however, must be weighed against the more important service qualifications.

The test results above set forth indicate the surprising resistance of NATCO Clay Conduit to the effects of shocks or impact, a degree of toughness not ordinarily expected in a vitreous material. Besides, NATCO Clay Conduit is carefully packed under new and tested methods that assure its safe arrival on the job.

After all, the prime requisite of conduit is to permanently protect the cables in service; such protection against moisture, steam, corrosion, electrolysis, fire and other hazards demands physical and electrical properties seldom found in conduit possessing unusually high resistance to impact.

NATCO Conduit thus offers maximum toughness and resistance to impact, commensurate with complete and permanent protection to the cables in service.



SAVES
SERVES
PERPETUATES
NATCO CLAY CONDUIT

NATIONAL · FIREPROOFING · CORPORATION

General Offices: Fulton Building, Pittsburgh, Pa.
Distributed in the United States by:
Graybar Electric Co., inc. Kellogg Switchboard and Supply Co.
Distributed in Canada by: Northern Electric Company, Ltd.

NATCO CLAY CONDUIT

modernization as well as extensions which will result with increased telephone traffic, will be continued.

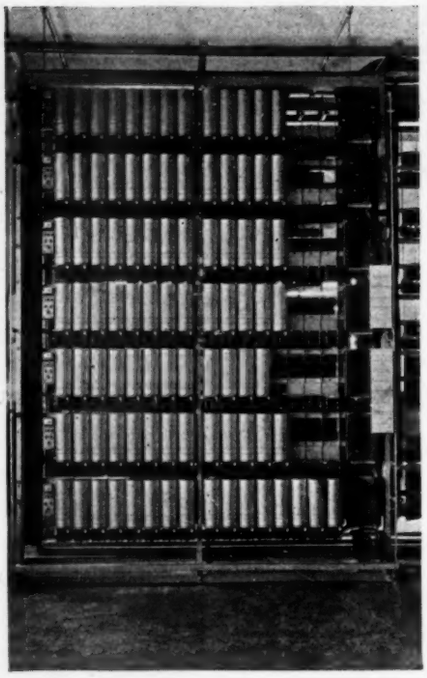
The cutover of the dial equipment took place at midnight of April 18, 1931, in the presence of a large group of telephone officials, church dignitaries, government executives and prominent business men. The ceremonies were opened by the Reverend Padre Ernesto de Albocacer, who blessed the building and equipment.

Following this, Senor don Carlos Daniel Roca, president of the Compania Telefonica de Barranquilla spoke on the activities of the company in Colombia, with special reference to its program for Barranquilla. General Manager H. E. Kepler then spoke briefly, describing the method followed in changing the city's telephone traffic from the old manual board to the new dial equipment. He then gave the signal for cutting over the equipment to I. P. Olson, installation foreman, and within a few minutes the new dial apparatus was cut into operation, ready to receive the first official call.

This was made by Governor Doctor Alberto Pumarejo in the presence of Mayor Vizcaino. In so doing the governor, on behalf of the city, expressed his appreciation of the introduction of the dial system into Colombia, and more especially for giving Barranquilla the honor of being the first city in the republic to be converted to this modern system of telephony.

Calls began to come in rapidly, the clicking of the equipment indicating that many telephone users were trying out the new dials in order to be among the first to make calls over the new system.

Credit is due Messrs. Cavan, local manager, Hodkinson, auditor, Carl Pracht, expert in pre-cutover publicity, LeCompte, manager at Cartageno and Reg. Kepler, manager at Cali, for their efforts prior to the cutover in perfecting traffic arrangements and acquainting the public with the operation of the new automatic dial system.



Strowger Connectors at Barranquilla Mounted on Type 119 (11-Foot 9-Inch) Frames.

The main doorway of the telephone building opens directly into the public offices, which together with the commercial departments occupies most of the first floor. With high ceiling supported by square pillars, this room presents a most attractive appearance. The mahogany woodwork forms a striking contrast against the white ceiling and walls. In the center to the rear of this room, a stairway leads to a balcony which runs across the entire back wall of the room. A decorative wrought iron balustrade borders the stairway and balcony.

From there stairs lead to the second floor, where the Strowger dial equipment, test desk and power equipment are housed. The toll positions, equipped also to handle information, complaint and special services, together with restroom facilities for the operators, are located on the first floor. A special battery room for the storage battery is provided adjoining the main structure in the rear.

The Strowger automatic dial equipment was furnished by the Automatic Electric Co., Ltd., of Chicago, U: S. A., and was manufactured by Automatic Electric Inc. At present 3,000 lines of this apparatus are installed, the space being ample, however, for 10,000 lines of equipment when increasing service requires it. Type 119 framework (11 feet, 9 inches high) is used throughout.

Self-aligning plunger-type primary line switches are used in conjunction with rotary secondary line switches. In addition to individual lines, connectors are provided for P. B. X. users, for two-party line subscribers and for four-party line subscribers, for city use. It is also intended to develop rural party lines, whereby six frequencies can be made use of.

The system uses four digit numbers, except for party lines, when a fifth digit is added to select the ringing frequency. It is not intended to go above four frequencies for the city lines. Duplicate sets of vibrator type harmonic ringing machines are installed to provide six frequencies.

Two motor-driven ringing machines are also provided to supply ringing current for direct line service. One set operates from the commercial current supply of 220 volts, 60 cycles, three-phase, while the other operates from the exchange battery.

Power is furnished by two motor-generator charging sets, one of 100-ampere capacity, the other of 50-ampere capacity. Switching arrangements are such that either or both of these machines can be used, depending upon the exchange load at any time. Provision has also been made for a third charging machine of 250-ampere capacity, to be installed when increased traffic makes such action necessary. The battery is charged on the full float principle.

The Balcony Across the Rear of the Customers' Room in the Exchange at Barranquilla Adds to Its Attractive Appearance.

National Convention to Be Held in Chicago October 20-23.

The 35th annual convention of the United States Independent Telephone Association will be held at the Stevens Hotel, Chicago, Tuesday, Wednesday, Thursday and Friday, October 20 to 23.

During the vacation season the officers of the association will consider various plans for the program, the details of which will be worked out after the summer season.

Prices in the Metal Markets.

New York, July 13: Copper weak; electrolytic, spot and future, 8c. Tin easy; spot and nearby, 25.12c; future, 25.37c. Soft lead steady; New York, 4.40c; East St. Louis, 4.22c.

"So Long TROUBLE!"

The man high up in the telephone company and the man high up on the telephone pole *both* are enthusiastic about Kester Solder!

The trouble-shooter finds Kester convenient to work with. No separate flux to bother with, for the flux is right there inside the solder.

As for the executive . . . he knows that Kester-Solder-protection for his lines will cut out high maintenance costs and add from 5 to 7 years to their life! Splices, sleeve-connections, grounds and drops all need the protection of solder. That's why many companies have rigged up travelling platforms, and are now soldering every joint in the system!

You need Kester! Write our Industrial Development Department about your soldering problems. Or get in touch with your jobber . . . he has Kester Solder on 1, 5 and 20 pound spools. Kester Solder Company, 4211 Wrightwood Ave., Chicago, Illinois. Incorporated 1899.

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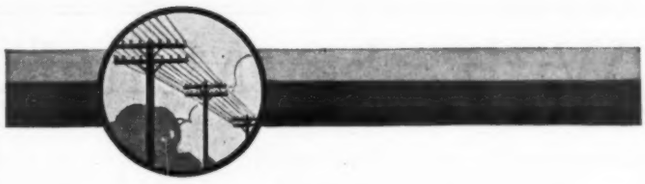

AN ORGANIZATION OF EXPERTS

IN the manufacture of any product, there are invariably certain things relating to design, to the quality and relative proportions of component materials, to the various processes of practical fabrication—which can be learned only by experience.

The manufacture of wires and cables is no exception. For telephone cables, for magnet wire, for power conductors—uniform conductivity, proper tensile strength and unfailing, durable insulation are of the highest importance.

For such products, experience is a prime requisite. For forty years this company has been in the business of manufacturing wires and cables—of every kind and for every purpose. Our employes are experts, trained to value quality above all else. As a result, the name Phillips has become a synonym for excellence, a guarantee of durability and quality. We will be glad to submit prices and specifications upon request.

We are manufacturers of—

Bare and Insulated Copper Wires—Rubber Insulated Wires—Enameled Wire—Magnet Wire—Power Cables—Switchboard Cables—Paper Insulated Cables—Flexible Cords—Electrolytic Copper Rods, Shapes, etc.

EUGENE F. PHILLIPS ELECTRICAL WORKS, LTD.

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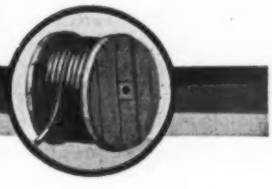
BRANCHES—WINNIPEG, TORONTO, REGINA AND VANCOUVER

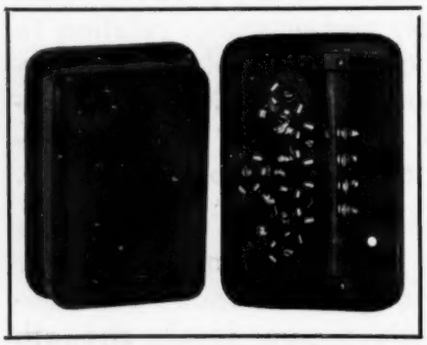


With the Manufacturers and Jobbers

American Electric Introduces New Transmission Test Unit.

American Electric engineers are now offering a small test unit which, it is claimed, offers the most economical and effective method of testing magneto transmission that has yet been devised.

The unit consists of a network of coils mounted in a steel box. The coils have a



The New No. 10 Test Unit for Magneto Transmission Introduced by American Electric Engineers. The View on the Left Shows the Unit Complete—The View on Right Shows the Unit with Cover Removed.

resistance equal to that of 64 miles of No. 12 gauge open iron wire. When the unit is inserted in the talking circuit, it artificially sets a standard by which magneto transmission can be judged in actual "talking tests." Conversation, with the coils in the circuit, should be natural and understandable. If it is not, trouble will be found in the subscriber's loop or substation apparatus, it is stated.

Two methods are offered for installing the unit in the switchboard. One is by wiring it into an extra cord circuit permanently and reserving this cord circuit for testing purposes. Another arrangement is to have the unit inserted between two subscribers' jacks from which the drop windings have been removed. Either method, it is said, offers a convenient test circuit at all times.

It is suggested that tests be conducted by the repairman and the operator. However, if conditions require it, testing can be made periodically by the operator in cooperation with the subscriber.

The cost of the complete unit is small. Full information regarding it may be obtained from American Electric Co., Inc., State at 64th street, Chicago, Ill.

Display of Colored Monophones in "Talkie" Theatre Lobby.

The Home Telephone Co. of Portsmouth, Ohio, recently utilized the latest type of colored monophones for a novel display stunt in connection with the feature talking picture "Three Girls Lost."

Five of these modern instruments in different attractive colors and one in black finish were placed on a table in the lobby of the local theater, where the picture was being shown. A poster in the center of the display read:

"'Three Girls Lost!' Have you seen them? Telephone any information to 406 Columbia Terrace. Special telephone facilities arranged by the Portsmouth Home Telephone Co."

The attractive display with the beautifully decorated theater lobby as a background attracted considerable attention from the public, many of whom had been previously unacquainted with the appearance of the monophone in color.

As an aid to stimulating extension as well as regular sales of telephone service, the Portsmouth Home Telephone Co. plans to arrange for similar displays to be used in conjunction with coming feature attractions in which the telephone plays an important part.

Orders for Stromberg-Carlson Switchboards Recently Placed.

A single unit No. 106 Stromberg-Carlson switchboard has been purchased by the Peoples Independent Telephone Co. for Winthrop, Minn. The board will be equipped with 220 central energy and 16 toll and rural lines and will be complete with terminal, power and machine equipment.

The Western Telephone Corp. of Oklahoma has purchased three sections of the No. 3 unit type Stromberg-Carlson switchboard for its Watonga, Okla., exchange. The board will consist of 400 central energy and 35 toll and rural lines and terminal, power and machine equipment.

The Blue Earth Valley Telephone Co., Blue Earth, Minn., has ordered three sections of the No. 3 Stromberg-Carlson unit type switchboard for installation at Blue Earth.

The switchboard will consist of 680 central energy and 65 toll and rural lines, with terminal, power and machine equipment.

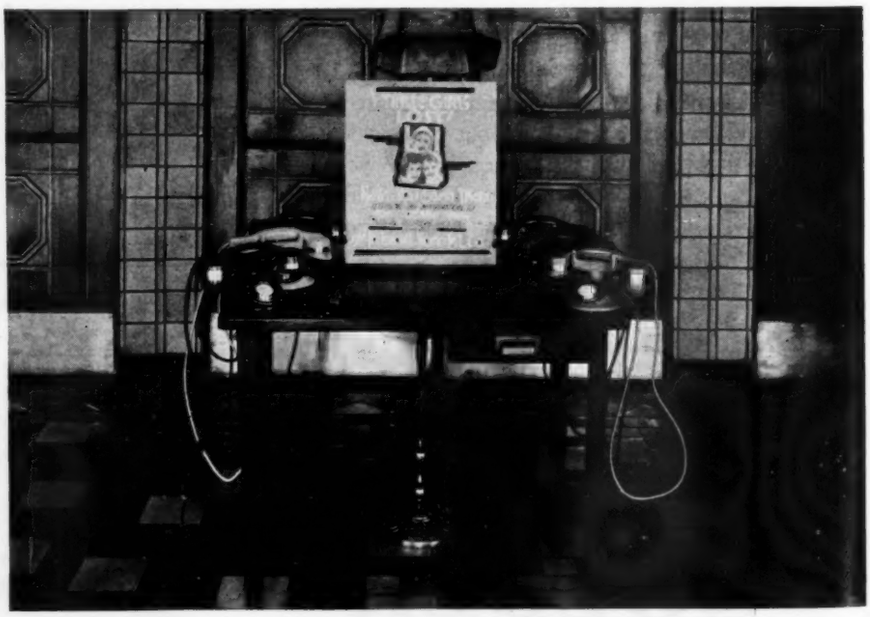
The Interstate Utilities Co., of Spokane, Wash., has purchased a two-position junior multiple switchboard from the Stromberg-Carlson Telephone Mfg. Co. The board will be equipped with 140 central energy lines.

The Oakdale Free Exchange Telephone Association of Oakdale, Ill., has just replaced its 26-year old Stromberg-Carlson magneto switchboard with a new No. 105 Stromberg-Carlson magneto switchboard.

The Central West Public Service Co., Omaha, Neb., has purchased a two-position junior multiple Stromberg-Carlson switchboard. The board will be installed in Central West company's exchange at Madison, Minn. It will be equipped with 400 central energy and 30 toll and rural lines and terminal, power and machine equipment.

Small Dial Telephone Exchanges in Southern California.

Southern California is known as a territory wherein dial telephones are largely used. It is in line with this development that the Southwest Home Telephone Co. of Redlands, Calif., has placed orders for small dial switchboards for the cities of

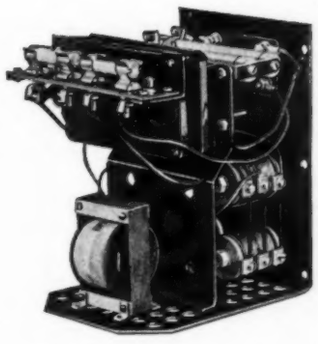


Novel Display of Colored Monophones by the Portsmouth (Ohio) Home Telephone Co. in "Talkie" Theatre Lobby.

No bulbs to burn out

—IN THE RECTOX RECTIFIER

A BURNT-OUT bulb can't stop a Westinghouse Rectox Rectifier from charging your telephone batteries. Rectox uses no bulbs. Always on the job, a Rectox laughs at the troubles of a bulb-type rectifier.



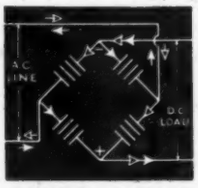
Rectox Rectifier with the cover removed.

In addition to having no bulbs, a Rectox Rectifier uses no liquids, no chemicals, nor moving parts of any kind. Having no parts to wear out, Rectox has a practically unlimited life free from trouble.

And you can install this rectifier out of sight behind your switchboards or anywhere that is most convenient to you, because your Rectox will be fitted to your particular application. You can depend upon this rectifier without keeping it under observation.

For full information about the complete line of Rectox for telephone service, write the Westinghouse sales office near you.

RECTOX



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Mitchell's

Principles and Practice of Telephony

These five books place thousands of practical facts at your command for instant use.

Beginning with a comprehensive survey of the basic principles involved, the author discusses such subjects as telephone apparatus, circuit elements and analysis, typical cord combinations, telephone power plant equipment, coil winding, the toll switchboard and toll equipment in the multiple office.

You learn about toll trunking, the nature and laws of telephone traffic, machine and automatic ringing, call distribution, trunk mechanical switching, mechanical-manual switching, etc.

All these subjects with scores of others, equally important, are treated in detail. Illustrations are used freely throughout the books and a comprehensive index enables the reader to put his finger immediately on any desired fact.

To earn an expert's pay, you know that an expert's knowledge is necessary. With these books you get the combined experience of many telephone experts—down in black and white, with 317 illustrations to help you.

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Send for These Five Practical Books to Examine Free

Look over the books and if they are not all we said they are return them at our expense. If you want to keep them, $2 in ten days and $2.00 a month for five months will pay for them.

Nothing to lose—everything to gain. Act now.

Act Now

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.,
370 Seventh Ave., New York

Gentlemen:—Please send me MITCHELL'S PRINCIPLES AND PRACTICE OF TELEPHONY (shipping charges prepaid), for ten days' free examination. If satisfactory I will send $2.00 in ten days and $2 per month until $12.00 has been paid. If not wanted, I will write you for return shipping instructions. **(Please write plainly and fill in all lines.)**

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Home Address .....

City and State .....

Firm or Employer .....

Occupation .....

Tel.-7-18-31

Moreno, Loma Linda and Yucaipa. These installations are of 23-line, 72-line and 65-line capacities respectively, and the equipment will be manufactured by Automatic Electric Inc., of Chicago.

Company Brings Modern Service to Progressive Michigan Town.

By J. L. Trevillion, *Representative, Kellogg Switchboard & Supply Co.*

Chesaning, Mich., served by the Chesaning Home Telephone Co., is a beautiful, prosperous town located in a fertile section of Saginaw county a few miles from the city of Saginaw. With its up-to-date stores, modern schools and churches, good roads and progressive people, Chesaning has a constantly increasing need for telephone service in its business and social life.

Operators at the New Kellogg Universal Switchboard Installed by the Chesaning Home Telephone Co. at Chesaning, Mich. Note Test Panel at Right of Switchboard.

Central Office Building of the Chesaning Home Telephone Co. at Chesaning, Mich.

Since 1909, when the Chesaning company took over the operation of the plant, telephone service has been consistently improved and the subscriber list has substantially grown. Further expansion took place last year when the company bought the Brant Telephone Exchange, a system with about 100 subscribers.

To keep up with the growing telephone needs of Chesaning and surrounding territory, the company recently completed the installation of a new Kellogg two-position universal switchboard. The change in equipment has made it possible for the company to give more efficient and faster service, with a resulting increase of subscriber satisfaction.

Although the company began with only 209 subscribers, its operators now serve over 630 subscribers, and complete approximately 70 long distance and 3,000 local calls daily. The Chesaning company maintains a neat, well-equipped central office and an excellent outside plant.

G. M. Peet, president of the company, is also president of the Peet Packing Co., Chesaning's largest industrial plant. Chas. W. Cheeney is secretary and manager, and has supervision over the outside plant. The installation and maintenance work of the exchange is ably handled by J. D. Ward, plant chief.

Obituary.

Thomas J. Gullion, aged 52, with a 31-year record in the service of the telephone industry, passed away at his home in Genoa, Ill., Monday, July 6. Death was caused by heart trouble, an illness from which he had been suffering for the past few months.

Mr. Gullion was born in Lebanon, Ind., and at an early age entered the employ of the old Indianapolis Telephone Co. of Indianapolis, Ind., where he rose from the ranks of lineman and trouble-shooter. Later he joined the sales department of the Western Electric Co. traveling northern Illinois and southern Wisconsin.

Twenty years ago he became associated with the Leich Electric Co. of Genoa, Ill., a connection which he maintained until his death. During his association with this firm he first traveled the state of Indiana with headquarters at Indianapolis, and later transferred to Illinois, making Dixon his home.

After serving this territory for many years, he again returned to Indianapolis, starting a distributing company for Leich Electric Co. products under his own name. Ill health caused him to discontinue this venture and he then made Genoa, Ill., his home, acting as factory representative and sales engineer for the Leich Electric Co.

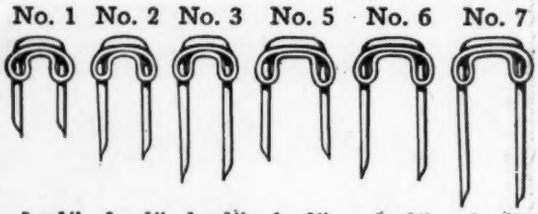
During his many years calling on the operating telephone companies, Mr. (Tommy) Gullion made many friends. He was also well acquainted with many in the power field, having served the last two years as sales engineer, pioneering the sale of the Leich power system dispatching map.

Mr. Gullion was a member of the Indianapolis, North Park Lodge, A. F. & A. M., and the Independent Pioneer Telephone Association of the United States.

He leaves to mourn his death his wife, a son, Donald, of Pittsburgh, Pa., two daughters, Mrs. Harold Eves of Muncie, Ind., and Miss Jean Gullion of Genoa, Ill.

EMERSON
INSULATED STAPLES

No. 1 No. 2 No. 3 No. 5 No. 6 No. 7

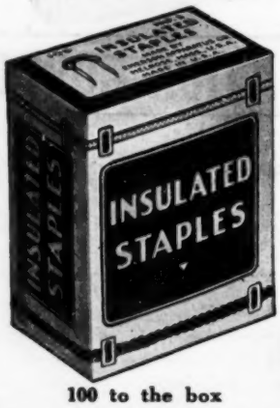


3/16 x 1/2" 3/16 x 5/8" 3/16 x 3/4" 1/4 x 5/8" 1/4 x 3/4" 1/4 x 7/8"

INSULATED STAPLES

Packed 100 to the box, 10 boxes to the carton, or 50 to the box, 20 boxes to the carton.

50 to the box



100 to the box

WIRING NAILS ALSO PACKED 100 to the box or 50 to the box.

5/8"

ALL METAL WIRING NAILS

Colors, green or white.

WRITE TO

EMERSON APPARATUS CO.

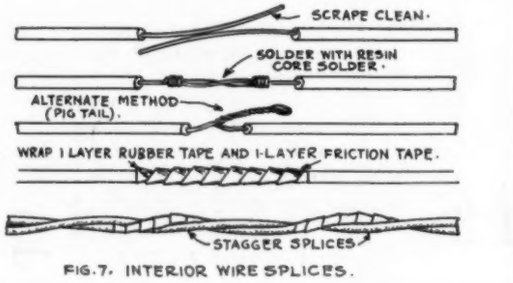
170 Tremont St. Melrose, Mass.

"Telephony's" Engineering Data.
By B. C. BURDEN.

Index, Subscriber's Set Data.
July 18, 1931.
No. 1-A, Page 7.

In fastening bell boxes or wall sets on a plaster wall, two ice picks are convenient tools to have available. They are used as follows:

The bell box or wall telephone set is held against the wall in the desired position and one of the picks placed in one of the upper screw holes and then driven through the plaster into the lath by hitting the handle of the pick with the palm of the hand. The set is then leveled and the other pick driven


SCRAPE CLEAN.
SOLDER WITH RESIN CORE SOLDER.
ALTERNATE METHOD (PIG TAIL).
WRAP 1 LAYER RUBBER TAPE AND 1-LAYER FRICTION TAPE.
STAGGER SPLICES
FIG. 7. INTERIOR WIRE SPLICES.

into the plaster through one of the bottom holes The set can then be easily managed while inserting the regular wood screw.

The bell boxes should always be mounted so that the tapper rod will be in vertical position.

Party-line telephones requiring a ground wire will necessitate a three-conductor inside wire make-up between protector and set.

After a telephone is installed, talking, ringing, and signaling tests should be made with the operator. The talking test should be made through a 20 db. pad to insure the detection of abnormal transmission losses.

In connection with the installation of extension telephones (desk type) which require no bell box—also the connection of outside wires to inside wires where no protector is required—a most useful device is the small connecting block.

Sufficient slack should be left at terminating points, such as protectors, instruments, bell boxes, etc., to care for changes or broken wires. This slack can be coiled up out of the way in sets and bell boxes and in other cases dressed into place so as to present a neat appearance.

In placing wires under screw heads or around terminal bolts always give the wire a single turn around the lug in the direction the screw or nut is turned when tightened.

Wires which must cross electric wires should be covered with circular loom or a porcelain tube. When a number of telephone circuits feed along the same route, bridle rings should be used.

"Telephony's" Engineering Data.
By B. C. BURDEN.

Index, Pole Line Construction.
July 18, 1931.
No. 5-B, Page 1.

Lightning Protection and Pole Type Protectors.

General.

Open-wire telephone circuits (longer than ¼ to ½ mile) which enter cable should be provided with lightning arresters (open-space cutouts) at the junction of cable and open wire. Failure to provide this protection will usually result in open and grounded cable pairs, due to lightning potentials getting into the cable via the cable pair and then arcing across the paper insulation to the sheath of the cable.

A lightning charge carried into the cable on a single cable pair may, when it breaks down, damage a number of other pairs in the same cable, so it is very necessary that adequate protection against lightning be provided. It should be noted that an open-space cutout also protects the cable against insulation damage from open-wire crosses with high voltage lines.

General Facts About Lightning.

The term "lightning" refers to heavy electrical discharges which take place in the atmosphere. The explanation advanced by scientists as to the causes of lightning is as follows: During a thunderstorm there are upward air currents with upward velocites of such magnitude that water cannot fall through these ascending air currents. Near the top of these vertical air columns the velocity of the air movement is somewhat reduced, which results in small drops of water forming into larger drops.

These larger drops of water are very unstable and after reaching a certain size they immediately break up into smaller drops. Each time a drop breaks up a separation of electricity takes place, the water receiving a positive charge and the air a negative charge. The moving air carries away the negative charge, thus leaving a free charge of positive electricity on the rain drops.

This process, which may be repeated over and over, results in moving rain clouds becoming very highly charged with negative electricity. The induced voltage on the floating clouds constantly increases until a point is reached when this voltage is sufficient to break down the air gap between the clouds and earth, or between adjacent clouds, so that the accumulated charge discharges to the positively charged earth or an adjacent cloud.

The total voltage of a lightning discharge may be several million volts, and the energy dissipated by a single flash has been estimated to be as high as 1,000,000 kilowatts.

Contrary to the popular conception of lightning effects on telephone circuits, it is seldom that a telephone line suffers a direct hit by a lightning discharge. In most cases the voltages set up on telephone circuits are the result of a lightning discharge between two clouds, or between clouds and earth, in the vicinity of the telephone line.

Due to the tremendously large voltages and currents involved, a high voltage may be set up in open-wire telephone circuits due to electromagnetic and electrostatic induction (usually an electro-static effect). Voltages as high as

"Telephony's" Engineering Data.
By B. C. BURDEN.

Index, Pole Line Construction.
July 18, 1931.
No. 5-B, Page 2.

30,000 volts have been recorded on an insulated clothes line located three miles from the source of a flash of lightning.

For a direct hit to take place it is necessary that the electrified cloud be nearly over the telephone line. A direct hit by a bolt of lightning, in addition to the electrical stresses which it imposes on telephone cable or connected equipment, will often cause damage to the wire or poles at the point where the discharge hits the line. Shattered and splintered poles are the result of a lightning bolt discharging to earth via the pole.

It is thought that this explosive action is due to the formation of steam in the pores of the wood as a result of the high current flowing through the wood. All wood which is exposed to the air contains a small amount of moisture.

The line wire will usually be melted at the point the discharge enters the wire. Cases have been known where lengths of several feet of drop wire have had the metallic

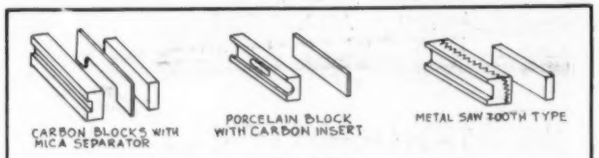


FIG 1 TYPES OF OPEN-SPACE CUTOUTS

portion of the wire completely vaporized and blown out through small breaks in the insulation. The voltages ordinarily induced on telephone circuits not due to direct hits will vary from a few hundred to 20,000 or 30,000 volts.

Open Space Cutouts.

There are a variety of open-space cutouts on the market consisting of carbon blocks with mica separator, porcelain blocks with carbon insert, metal saw tooth type, etc. See **Fig. 1.**

The factors which we must be concerned with in selecting an open space cutout are:

1. Breakdown voltage.
2. Self-cleaning features.
3. Protection against high-voltage power-line crosses.

An open-space cutout serves two purposes: It offers a low impedance path to ground for the lightning charge; and if properly connected as a cable protector, it will place the conductors inside the cable at sheath potential when broken down by a lightning or power voltage discharge. Inasmuch as the breakdown voltage of an open-space cutout is principally dependent on the air gap spacing, it is desirable that this gap be made sufficiently small to insure that the gap will break down at a lower voltage than the equipment or cable being protected.

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MANUFACTURERS' LITERATURE

The following is a brief description of recently published bulletins, catalogs, etc. If you are interested in obtaining copies address your request to the manufacturer.

POLE SETTERS

"Highway Model D Earthboring Machine and Pole Setter" is the title of a 4-page bulletin describing and illustrating the application of this equipment on any 1½ or 2 ton truck and its uses. **Highway Trailer Co., Edgerton, Wis.**

RECORD SYSTEMS

Forty-eight-page booklet on Visible Record Equipment designed for business offices and public utilities. Describes special equipment designed for telephone companies. **Acme Card System Company, 8 S. Michigan Ave., Chicago, Illinois.**

RECTIFIERS

Bulletin with prices is available on a new Power Filter Unit, which converts Alternating Current into pure, non-pulsating, humless, Direct Current for use on telephones, sound-on-film, public address systems, inter-communicating systems, clock and signal systems, magnetic chuck operation and elevator control. The unit has innumerable applications where direct current is required. **The Power Filter Division, Square D Company, 6060 Rivard St., Detroit, Mich.**

RINGING CONVERTERS

Bulletin No. 150 entitled "Leich Ringing Converters" describes and illustrates converter equipment for producing ringing current; this includes harmonic converters, ringing frequency converters and ringing converters with charger equipment. **Leich Electric Co., Genoa, Ill.**

SWITCHBOARDS

Twelve-page bulletin No. 181, describing Masterbuilt Switchboard assembly and operation. Description contains complete details regarding the 3 sizes of Masterbuilt boards—the 6—800, the 16,000 and the 4,200. **Kellogg Switchboard & Supply Co., Chicago, Illinois.**

SWITCHBOARDS (P-A-X's)

Engineering Bulletin 322, dealing with Type 50 Strowger P-A-X, is now available. It will be sent to any telephone man interested in Private Dial Systems of fifty lines and up. **Automatic Electric, Inc., 1033 W. Van Buren St., Chicago, Ill.**

TELEPHONES

Revised edition of a 16-page catalog No. 100, showing all types of conventional and monophone instruments for local and central battery service. Piece-part numbers and circuit details are also given. **American Electric Company, Inc., State and 64th Streets, Chicago, Ill.**

TELEPHONES

Bulletin 1034, a completely revised and enlarged catalog of Strowger Dial Telephones and Telephone Parts, both for central battery and for local battery service. Among the new items included are pay stations, the Strowger Telephone Call Recorder, and the filter coil unit for eliminating radio interference from subscribers' dials. **Automatic Electric Inc., 1033 W. Van Buren St., Chicago, Ill.**

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WHAT THE COURTS AND COMMISSIONS ARE DOING.

(*Continued from page 32.*)

pass another legislature and a referendum vote of the people, will change the constitution to seek this end.

Another resolution, also passed, provides for another constitutional amendment which would open up the debt limit for municipalities where bonds are issued against electric utility income-producing properties. This resolution, passed by the 1929 legislature, will be put to referendum vote in November, 1932.

The Loomis power district bill, named after Senator O. S. Loomis, Mauston, who fathered the utility program under Governor LaFollette, was fought in the legislature but finally was passed. It provides for the creation of power districts comprising cities, villages and intervening rural territories. These districts are given the power to generate, transmit and distribute throughout their areas.

Another new law is a strict regulatory measure. It was introduced by Senator Thomas M. Duncan, a Milwaukee Socialist leader, who surprised Wisconsin recently by becoming Governor LaFollette's executive secretary.

The law, which makes the old railroad commission the public service commission, gives that board of three men more power in regard to the holding company problem, provides more effective regulation and control of the issuance of public utility securities, gives the commission the right to control the depreciation reserve of utilities and halt the paying out of dividends, unless a suitable reserve is set aside, and provides that utilities rather than the taxpayers should bear most of the costs of regulation.

Summary of Commission Rulings and Schedule of Hearings.

ILLINOIS.

July 7: The Assumption Mutual Telephone Co. asked for authority to issue and dispose of $20,000 of its first mortgage 6 per cent bonds.

July 14: Hearing at Chicago in the matter of proposed advance in rates for telephone service in Chatsworth stated in rate schedule Ill. C. C. No. 2 of the Illinois Commercial Telephone Co. No. 20683.

INDIANA.

July 8: Petition filed by the Eastern Indiana Telephone Co., of Winchester, for permission to buy the Modoc Telephone Co. and the Centerville Telephone Co. The combined properties are valued at $40,000.

July 31: Hearing at Princeton of the controversy between the Princeton and Francisco Telephone companies regarding toll rates. It was postponed from June 30 to this date because of the extreme heat.

KANSAS.

June 29: Complaint against the American Telephone Co. filed by the Council Grove Telephone Co. that the American company has cut off its long distance connections, furnished up until two years ago. The mutual company, after suffering two years from lack of long distance service, cannot stand it any longer, and appealed to the state commission for relief.

MINNESOTA.

July 9: The commission authorized the Murdock Central Telephone Exchange Co. to sell and transfer all of its telephone properties at Murdock, Minn., and vicinity to E. B. Peterson, an individual. Upon investigation the commission finds that the proposed sale and transfer will not conflict in any way with the public interest and will extend and improve the telephone service now furnished.

July 10: The commission granted permission to the Central West Public Service Co. to reduce its gross rate for multiparty rural service from $2.25 to $1.75 per month at Prior Lake.

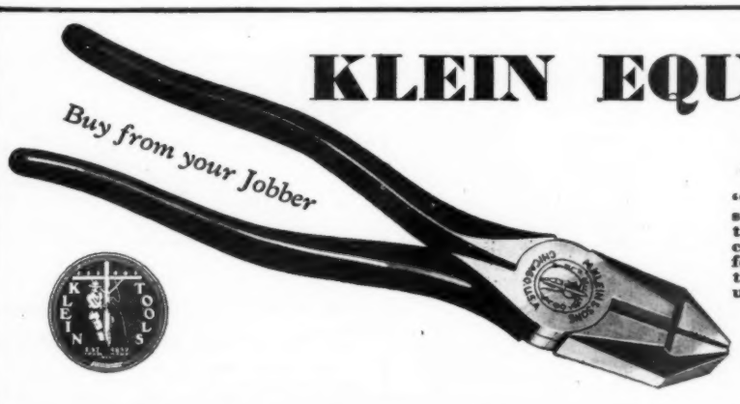
July 30: Hearing at Debs schoolhouse, located 10 miles north of Pinewood, in the matter of complaint of the Aure Farmers Co-Operative Telephone Association of invasion of territory by the Alaska Township Telephone System. The hearing was originally set for July 21. M-2146.

MISSOURI.

July 8: Joint application filed by Scotia Telephone Co., a corporation, to purchase, and P. K. Higgins, owner of the Beaufort Telephone Co., to sell the telephone exchange located at Beaufort, and for a certificate of public convenience and necessity to the Scotia Telephone Co. to operate property.

July 29: Hearing in Fayette on complaint of the public service commission vs. the Southwestern Bell Telephone Co., the Kansas City Power & Light Co., and the Missouri Power & Light Co.

The complaint charges the telephone service rendered by the Bell company is unsatisfactory due to inductive interference from the lines of the power companies.



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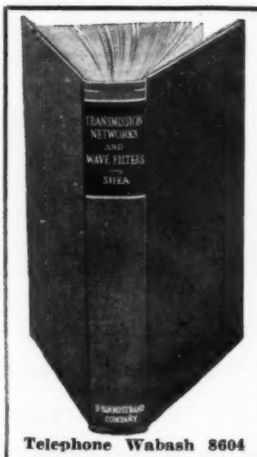

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NEW YORK.

July 8: Consent given to purchase by the New York Telephone Co. of telephone system of Sullivanville Telephone Co., serving about 35 stations in towns of Erin, Horseheads, Veteran and Cayuga.

July 9: The commission ordered that the proceeding relative to the service furnished by the Black River Telephone Co. in the Old Forge, Eagle Bay, Inlet, Raquette Lake and Blue Mountain territory be closed on its records, in view of the fact that a comprehensive plan of improvements, commenced in 1927 and involving an expenditure of about $125,000, has been completed, and the sources of complaint eliminated.

NORTH DAKOTA.

June 8: The commission granted the application of the Farmers Mutual Telephone Co., of Powers Lake, for authority to change the location of certain telephone lines. I-2086.

June 8: The commission granted the joint application of Charles F. Bleckried, Baldwin, N. D., to buy, and the Northwestern Bell Telephone Co. to sell, telephone property located in Baldwin, N. D. I-2087.

June 13: The commission granted the joint application of the Absaraka Tele- and L. F. Chaffee to sell telephone property in Wheatland and Empire townships. I-2094.

June 13: The commission granted the application of the Kathryn (N. D.) Telephone Co. for authority to remove certain telephone lines. I-2095.

June 25: The commission approved the application of the Farmers & Merchants Telephone Co., of Flaxton, to reduce farm line rentals. I-2100.

OHIO.

June 30: The Ohio Bell Telephone Co. authorized to issue $30,000,000 of its common stock to be sold at par to the American Telephone & Telegraph Co. to reimburse its treasury for uncapitalized expenditures for improvements to its properties prior to March 31, 1931.

July 21: Hearing on the suspended increased rate case of the Ohio Cities Telephone Co., of New Philadelphia, postponed to this date from June 23. The company is protesting against the tentative valuation placed upon its property by the commission on March 20 in connection with the company's application for new rate schedules for New Philadelphia and Dover. The commission found the company's reproduction value to be $883,833.92; the depreciation, $76,169.87; and the present value, $807,764.05.

OKLAHOMA.

July 20: Hearing in the case of the City of Kingfisher vs. the Western Telephone Corp., in which the complainant alleges inadequate telephone service and asks for a modern telephone system. No. 10,743.

July 21: Hearing on application of the Southwestern Associated Telephone Co., of Yale, Okla., for permission to make a charge of 25 cents per month over the regular deskset rate for the handset type of telephone. The commission will be asked to make a ruling in connection with this application, which will apply generally to the use of all such sets installed by any telephone company in the state.

WISCONSIN.

June 30: Joseph H. Ticheoner and 29 others of Sparta filed a petition asking that telephone rental rates of the Monroe County Telephone Co. be reduced and requesting an investigation of the rates in Sparta.

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